August 22, 2006

Memorandum

To: Ohio Election Officials

SUBJECT: REPORT ON THE CUYAHOGA COUNTY MAY 2 PRIMARY ELECTION

In April 2006, prior to the May 2 primary, the Cuyahoga County Commission contracted with the Election Science Institute (ESI) to conduct a comprehensive review of how their new voting system actually worked on an election day. ESI's report, including the performance of the Diebold Accuvote TSX voting system, was released by the Cuyahoga County Commissioners. Since then, Diebold circulated a response to the report, to which ESI has responded (see attached).

ESI understands that Ohio's election officials have been under intense scrutiny and that the challenges of implementing both HAVA and House Bill No. 3 are enormous. ESI had the privilege of working with several Ohio county election officials on this report. We were impressed by their professionalism and commitment to the integrity of the elections process. For this reason, we are concerned that the findings of this report have been misinterpreted and misreported.

First and foremost, the ESI report is not an attack on the Diebold Accuvote TSX system. Indeed, the report findings include very positive reviews of the system from voters and booth workers.

ESI understands that a voting system is not just a piece of equipment: a voting system cannot be separated from the people who run the system – including the election officials, the booth workers and the voters – and the procedures for administering the system. While the Diebold equipment passed both federal and state certification requirements, ESI sought to analyze the entire election system in the real-world and sometimes extreme conditions of an actual election.

In conducting this research, ESI's sole intention was to provide assistance to Cuyahoga County. The report does not affix blame to the vendor, the election staff, the booth workers or the voters; rather, the report describes what ESI found when researchers surveyed voters and booth workers, looked at the incidents reported by booth workers, and examined results recorded both on paper and electronically.

Criticism of the report by Diebold has focused on discrepancies between the Election Day memory card and the internal memory. ESI remains optimistic these discrepancies can be easily resolved. As Ohio election officials understand, however, the test of a voting system in a close election will be the ability to produce a paper record.

The good news from ESI's report is that only 3.9 percent of the incidents reports (the booth workers' Election Day report) concerned the printers. At the same time, members of the manual count team

found that 10 percent of the paper ballots were physically compromised in some way. ESI believes having this information now, when there is still time to implement contingency measures and other solutions before the General Election, is better than finding it out in a recount. And that was our goal.

Are the issues raised in the report fixable? ESI believes they are. This county has immense talent and resources both in the elections community and in the science community to solve these issues.

The report also has information, that we believe can be very valuable to election officials. In particular, the booth worker survey findings provide information on booth workers' motivation for serving, recruitment, training and demographics. While you probably don't have time now, we hope you will look at other sections of this report later.

Having now worked with both Cuyahoga and Franklin Counties, ESI has witnessed remarkable dedication to sound implementation of new systems and laws despite contentious – almost poisonous – public controversy. ESI is proud to have been a part of the process.

Sincerely,
ELECTION SCIENCE INSTITUTE

Steven Hertzberg,
Project Director

August 20, 2006

Mr. Lindroos
Mr. Radke
Diebold Election Systems, Inc.
PO Box 1019
Allen, TX 750013

SUBJECT: RE: LETTER OF AUGUST 16, 2006 FROM MICHAEL LINDROOS AND AUGUST 15, 2006 STATEMENT BY MARK RADKE

Dear Mr. Lindroos and Mr. Radke:

We have carefully reviewed your letter of August 16, 2006. With the November election just around the corner, time is short for putting in place an action plan to address challenges that surfaced in the May 2 Primary Election. We regret that Diebold has chosen to view the ESI report as an attack on its product, particularly when some of the findings in the report, in fact, reflect positively on the Diebold Accuvote TSX.

Precious time has already been lost in the week since the report was issued. ESI believes that everyone – not least other election officials in Ohio using the same system – stands to benefit from a truly cooperative effort between ESI, the Board of Elections and Diebold to determine what happened on Election Day as well as necessary actions to be taken between now and November.

ESI was heartened by the results of our joint effort on Saturday, August 19, not least because we were able to determine plausible explanations for some of the discrepancies found between the two electronic tallies. We hope that Diebold will continue that same spirit of cooperation to tackle remaining issues, such as the discrepancy between the VVPAT results totals and the election day memory totals.

Per your request, on Friday to put our questions in writing, ESI sent you the attached list that same day. We sincerely hope you will reverse your decision not to answer these questions: the Board of Elections, the County Commissioners and the voters, as well as ESI researchers, deserve a straightforward response.

The claims made in your letter can be categorized as follows:

- Booth worker issues

- Memory card issues

- Printer issues

- Accounting for 17-year-old and curbside ballots

In what follows, we address each of these categories.

Booth worker issues

Undoubtedly, human error is a fact of life in almost any transaction and is a particular risk in a process as episodic, unpredictable, and complex as an election. ESI is aware of the important role booth workers play in the success of the election system, and that is one reason much careful analysis by highly qualified researchers went into Section 3 of our report. Without question, a great deal more thought and effort must go into recruiting, training, and retaining these important Election Day workers. In order to assist the Cuyahoga County Board of Elections in doing so, ESI completed a survey of the demographics of booth workers and precinct supervisors for the May 2006 Primary Election. Among the key findings is the fact that booth workers are disproportionately older females. Most booth workers have tremendous prior experience as election workers: the median number of prior elections worked was ten for booth workers. Surely Diebold does not mean to disparage the ability or commitment of this core group of volunteers. We would suggest that Diebold and the Board of Elections turn to these volunteers to assist with field testing of the systems and in designing, testing, and evaluating pre-election training.

Additionally, since reliable systems design means the system is still reliable when used by a wide range of people with varying skills, it begs the question of why the vendor didn't heavily emphasize, when they offered their product for sale, the amount of training that would be required to use the product effectively.

Memory card Issues

Diebold attributed differences in vote totals to the swapping of memory cards. As of August 20, 2006, the Board has not been able to confirm this explanation. This is an interesting explanation for several reasons. First, ESI did not attribute memory card swapping between machines as a reason for the discrepancy in votes because we did not know, until reading your statement of August 15, 2006, that it was possible or even permissible to swap memory cards between machines. This new information, while it might explain some things, is extremely problematic. Swapping memory cards may impair an audit, at least, and could facilitate vote manipulation, at worst.   Without the appropriate system design measures, memory card swapping could result in a total loss of accountability. We look forward to receiving additional information from Diebold about how its TSX system behaves when memory card swapping occurs.

In the mean time, ESI is conducting a memory card to election archive comparison of election data on a machine by machine basis in order to determine if we can find any evidence of memory card swapping and its possible impact. We request Diebold's help in validating its claim that booth workers switched memory cards between machines.

Printer issues
Thermal printers may be very reliable, as Diebold claims. As the physical evidence from the Manual Count of VVPAT ballots indicates, however, these printers are not immune to printer jams and other irregularities, and because paper ballots are the official ballots in Ohio printer issues affect the official tally.

The observations that votes could not be audited because of damage to VVPAT ballots caused by the machines' printers were based on verbatim observations made by booth workers in our survey of booth workers and should not be construed as a statement made by ESI. For the record, we are aware that the TSX printers are thermal and do not use ink.

Accounting for 17-year-old and curb side ballots
In Cuyahoga County, eligible disabled voters may vote "curb-side" optical scan ballots and 17-year-old voters may cast provisional optical scan ballots at the voter's polling location. After the May 2 election, due to the inoperability of the Diebold optical scan system, these ballots were re-cast by the BOE on TSX machines located at the BOE.

The ESI study examines only ballots cast and results from the touch screen VVPAT devices used on Election Day in the sample precincts. Accordingly, in repeated emails to the BOE and in conversations, ESI requested data from only those memory cards in the touch screen devices used on Election Day at the 50 sample polling places.

It appears, although ESI is currently validating this supposition, that the memory card data sent by the BOE, which was aggregated by polling location – even after seven weeks of repeated requests to eliminate the data from memory cards used for re-casting votes after Election Day –included votes from "curbside ballots" and ballots cast by 17-year-old voters.

Per the agreement reached on Friday, the BOE is now providing machine-level data from the Election Day memory cards that will allow for independent verification that may resolve these discrepancies between Election Day memory card data and on-board memory card data. In resolving these discrepancies, however, this explanation raises other questions.

- Why, after seven weeks, was it not possible for the BOE to produce memory card data from the DRE devices used at the samples polling places?

- Why was the BOE unable to separately account for ballots re-cast on DRE devices at the BOE after Election Day?

We hope this information will help clarify the report for you. We look forward to working with you and the Board of Elections to continue resolving as many of these issues as possible as quickly as possible.

Sincerely,
ELECTION SCIENCE INSTITUTE

Steven Hertzberg,
Project Director

cc: Mr. Hugh Shannon, Cuyahoga County Commissioners
     Mr. Tom Hayes, Cuyahoga County Board of Elections
     Mr. Michael Vu, Director of Elections, Cuyahoga County
     Mr. David Byrd, President, Diebold Elections Systems
     Ms. Jessica Hiner, Diebold Election Systems

Election Science Institute Outline of Questions for Diebold

Major Discrepancies

- How do you explain the difference between the VVPAT Summary and the VVPAT Ballot tally? From where does info for VVPAT summary come – machine, memory card, other?

- How do you explain the difference between the election archive and the memory card data?

- There are 24 DRE machines in our sample that display no record of the May 2nd election. These machines were deployed to vote centers on Election Day and returned. How can ESI independently validate that these DRE machines were not used on Election Day?

- How do we independently verify that none of this discrepancy can be attributed to software error?

- Does the TSX allow a voter to cast a ballot before the TSX is zero'd out on Election Day

Moving Memory Cards

- Do you have any evidence that poll worked move memory cards on election day?

- Can you move the VVPAT between two machines on Election Day? If so, how? And what happens?

- How does the election archive account handle a new memory card being inserted during Election Day? (memory card with different ballot structure)?

- Do the audit logs tell us if a memory card has been changed during Election Day?

- What happens when you move a VVPAT Cartridge between machines during the middle of a roll on Election Day? Is there any record created showing this action? Are ballots cast when in new machines identified as being in new precinct for purposes of recount?

- When a duplicate memory card is created, how does Diebold recommend that BOE's track these duplicates and upload the last memory card utilized?

- It was our understanding, based on our meeting with Diebold representatives on August 18, 2006, that the TSX unit takes on the configuration of the memory card inserted. If this is this the case, does the TSX election archive overwrite the memory card data? What happens when memory card is returned to original voting unit?

Recast Ballots

- Does the Diebold TSX system allow for the casting of provisional ballots? If Board initially determines voter was not eligible to vote and does not initially count provisional ballot, is ballot retained for purposes of challenge to Board's decision?

- What happens if a voter's ballot is not cast and then the voter wishes to challenge this decision, can this be done?

Improving Auditing

- Can you create an SOVC report that prints by machine id (by Nov 2006)?

- Can you print the precinct no. and machine ID on each VVPAT Ballot?

- Can you standardize on a single report format?

Other

- Incident reports indicate Diebold technicians worked on machines during Election Day. What did they do and were they accompanied by Board of Election employees? Can we receive a list of the names of these individuals who worked on Election Day?

- Does the TSX give any warning that the printer is not working?

- How does Diebold ensure integrity of the machine and vote count during transportation of the devices once polls are closed? What prevents someone from entering additional votes after the close of polls?

- Can you provide the audit logs in electronic format?

Inventory & Control

- How is the BOE supposed to ensure that all VVPAT Cartridges are returned on election evening? Do you have a process to recommend to your clients?

Error Trapping

- How do you verify the successful download of ballot data from the TSX to the memory card?

- How do you verify the successful upload of ballot data from the memory card to the GEMS Server.

Diebold Techs on Election Day

- In many cases the poll workers were complaining that a Diebold rep had not shown up. Did either Diebold, the BOE, or some combination of the two promise them that there would be Diebold reps on the scene?