



## **Voting Systems Testing Board Major Deficiencies Report Hart InterCivic**

**February 15, 2008**

### **Executive Summary**

The enactment of House Bill 08-1155 provides the Secretary of State (Secretary) with increased authority over the testing process and allows for additional testing and communication with the vendors and counties by this office. The legislation allows for an order to decertify a voting system to be amended or rescinded if it is determined that the major deficiencies have been resolved or mitigated. As part of the decision to amend or rescind an order, HB1155 allows the Secretary to consider the “accuracy and security procedures, audits, processing functions, and other relevant procedures used by county clerks and recorders in accordance with the laws and rules governing the conduct of elections.”

This report by the Testing Board addresses the major deficiencies identified by the Secretary in his order on December 17, 2007 (December 17 decision) decertifying components of the Hart voting system. This report explains the additional information provided and additional testing that has occurred since the December 17 decision.

### **Testing Board Findings**

The Hart Software, System 6.0 (EMS), including Boss (4.2.13), Tally (4.2.8), Rally (2.2.4), Servo (4.1.6), and eCM Manager (1.1.17); the eSlate Direct Record Electronic (DRE) voting machine, Version Number 4.0.19; Judges Booth Controller (JBC) (4.0.19); and Verifiable Ballot Option (VBO) (1.7.5) were certified with conditions for use as part of the December 17 decision. The Central Count Scanner and Ballot Now Software, Version Number 3.2.4, and the eScan Precinct Scanner, Version Number 1.1.6 were decertified with the major deficiency, as identified in the Secretary’s order, of a failure to count ballots correctly.

As part of the testing conducted prior to the December 17 decision, the Testing Board discovered the precinct and central count optical scanners (Optical Scanners) to be producing inconsistent results. Voting System Certification staff marked 1,200 ballots, with Hart approved marking devices, with a particular pattern provided by the Testing Board, then ran the ballots through the Optical Scanners. The same ballots were then run through the Optical Scanners a second time in order to establish a baseline to use for verification of the accuracy of the equipment. In the process, a result different from the first scanning was produced.

The Testing Board examined the 1,200 ballots that produced differing results from the Optical Scanners and discovered that extraneous marks on the ballot caused the inconsistency in processing of the ballots by the Optical Scanners. The results were inconsistent, but three

outcomes were discovered. The Optical Scanners accepted the ballot and counted the extraneous mark as part of the vote; accepted the ballot and did not count the extraneous mark as part of the vote; or rejected the ballot without counting any races. This outcome was demonstrated to change with multiple scanning of the same ballot indicating a failure to consistently detect marks on the ballot. Even if the system was demonstrated to count all mark patterns consistently, marks that could be characterized as “unnoticeable” by visual review were registered as a valid vote.

The Testing Board recommended decertification based on the systems failure to accurately and consistently tabulate the ballots cast as well as additional failures as listed in the “Hart InterCivic Project Overview Binder rev. – A.2”. Thereafter, the Secretary decertified the identified components of Hart’s voting system on December 17, 2007, citing accuracy and consistency as the major significant issue with the Hart Optical Scanners.

Following the decision to decertify, the Secretary ordered the Testing Board to review the various array of marks responsible for the inconsistent results. Ballots were marked with 50 different types of marks then passed through the optical scanner. Of the extraneous marks tested, only ten (10) types of marks were identified as causing the inconsistent results, ranging from “pen rests” to marks that could be reasonably determined as voter intent.

The Testing Board has identified the marks and drafted procedures to be used by the county to ensure that ballots do not contain extraneous marks and accuracy is ensured. The identification of these marks and proper handling by the counties will increase the proper tallying of ballots and the reporting of accurate and complete results.

For the eScan precinct count scanner, because the ballots are inserted into the scanner by the voter at the precinct, a pre-sorting procedure for the voter to follow is not practicable.

Consequently, the Secretary requested the Testing Board share other possible procedures to diminish the potential problems associated with extraneous marks on ballots to be counted by Hart’s eScan and Central Count Scanner. The Testing Board submits the attached procedures, but makes no formal recommendation regarding the use of the procedures due to the introduction of a human process and the necessity in this instance to override existing rules regarding ballot processing.

The Testing Board reviews and tests voting systems based on a standard of strict compliance. This means that any voting system that fails one test will not be recommended for certification. However, the Secretary is obligated under law to a standard of substantial compliance. Factors which must be considered under substantial compliance include the extent of noncompliance with the Election Code and the purpose of the provision(s) violated and whether or not that provision can still be achieved despite the violation.

The information listed in the previously posted “Hart InterCivic Project Overview rev - A.2”, set forth the necessary conditions to be fulfilled in order for such equipment to be used should the Secretary certify the system for use in the State of Colorado.

## Hart Central Count Scan Pre-Sorting Procedure

Notes: 1) This procedure would require the temporary repeal of Rule 27.4.2(b)(2), which requires ballots to be processed through the optical scanner before being subject to review.

2) Serialized ballots are required to implement this procedure.

3) This Procedure does not work for eScan devices used at Polling Places.

Each ballot in a batch will be inspected by at least two separate sequential teams before being scanned by an optical scanner as follows:

1. The first team will separate improperly marked ballots from the properly marked ballots. Any box that is marked similar to the conditions identified in Table 1 will be considered to be improperly marked.
2. Ballots identified as being properly marked will be passed on to a second team for a secondary evaluation, to verify that no stray marks are present and the ballot is properly marked. All ballots that have been evaluated two times and found to be properly marked shall be placed into batches for processing according to the manufacturer's instructions.
3. The ballots sorted as improperly marked will be passed on to a "Resolution Board" where the intent of the voter will be determined and duplicate ballots filled out, per Rule 27.4.2(c)(5). The duplicated ballots will be assembled into a new batch or batches for processing according to the manufacturer's instructions.
4. All batches of ballots will then be processed through the optical scanner and Ballot Now. All ballots shall be manually resolved through Ballot Now, looking at every race on each ballot in the batch, resolving and confirming the voter intent is recorded correctly.
  - a. An alternative to step #4 would be to have a third "pre-process" review team evaluate the ballots, and then follow a normal resolve process according to the manufacturer's instructions.
5. For any ballot in any batch that cannot be manually adjusted (resolved) to the correct value, the batch shall be deleted, the problem ballot duplicated according to step #3, and the batch rescanned and processed according to step #4.
  - a. An alternative to step #5 would be to not attempt a manual adjustment, but proceed to delete the batch, and duplicate ballots according to step #3.
6. For each batch processed, an audit log shall be produced indicating the presence or absence of manual resolution for all ballots in the batch. This can be accomplished by using the "search audit log" function (under reports from Ballot Now) and selecting at least the following audit codes: 19, 41, 32, 34, 58, 61, 63-69, 75, and 85.

To limit the size of the report, the date and time can be limited to represent the time that the specific batch of ballots was processed. This filtered audit log report must remain with each batch of ballots that were processed.

7. At the end of ballot processing, a complete election database audit log shall be printed and saved for the canvass process.

## **Hart eScan Procedure**

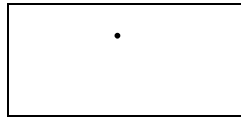
In order to increase the accuracy and integrity of the voting process, counties using the Hart eScan should take the following steps to mitigate the risk of extraneous marks on ballots.

The following are measures to be implemented by the county:

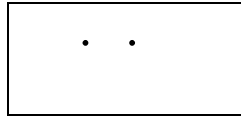
1. Election Judge Training
  - a. Train Election Judges on the types of extraneous marks, as identified in Table 1, which could be problematic for the optical scanner and the impact of the marks on the voters' ballots.
2. Polling Location Signage
  - a. Post signs near ballot deposit locations making the voter aware of how to properly complete their ballot and how to avoid any of the identified extraneous marks on their ballot to ensure their ballot is accurately counted.
  - b. Signs shall include the table of known stray mark issues as identified in Table 1.
3. Use of the Hart eScan on Election Day
  - a. Election Judges shall be required to ask the voter to review their ballot prior to the ballot being cast into the Hart eScan; and inform the voter of the consequences of stray marks on their ballot.
  - b. The voter shall check their ballot for extraneous marks and ensure that their ballot has been properly completed.

**TABLE 1 – STRAY MARK CONDITIONS**

Teams of reviewers will be evaluating ballots for the existence or absence of the following 10 conditions:



Single Dot or “pen rest” situations – may be anywhere inside the target area.



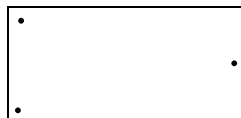
Double Dot or “double pen rest” situations – may be anywhere inside the target area, but dots are close together.



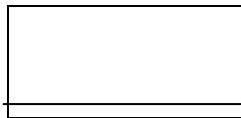
Double Dot or “double pen rest” situations – dots appear at opposite corners of the target location.



Double Dot or “double pen rest” situations – dots appear at opposite corners of the target location.



Triple Dot or “triple pen rest” situations – dots appear exactly as diagramed.



Single Line entry in the bottom third of target box. Line may be partial, complete, or extending beyond the target area.



Single Line entry that crosses the upper left corner of the target area.



Single Line entry that crosses the bottom left corner of the target area.



Single Line entry that crosses the top right corner of the target area.



Single Line entry that crosses the bottom right corner of the target area.

