Quarterly Maintenance Test Procedure ES&S DS200, DS850 & AutoMARK



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1. QUARTERLY MAINTENANCE OVERVIEW

The following procedure outlines the recommended processes that a County Board of Elections (CBOE) should perform during quarterly maintenance. The State Board of Elections (SBOE) requires quarterly maintenance to be performed during the following timeframes:

- 1. January 15 April 15
- 2. April 16 July 15
- 3. July 16 September 15
- 4. September 16 November 15

Note: During a quarter when an election is held, the pre-qualification test (a.k.a. pre-election test) will meet the criteria for that period's quarterly maintenance.

By performing quarterly maintenance, the CBOE can verify that the voting system is properly functioning. A voting system consists of the DS200 optical scanner, the AutoMARK ballot marking device (BMD), DS850 central count (if applicable) and the election management system (EMS). Preventative maintenance procedures and manuals have been provided to the CBOE by the voting system vendor. You are free to add additional maintenance steps that you may want for your purposes. The recommended steps detailed in this document should be considered as minimum requirements to meet, to ensure the machine is in proper working condition and that it continues to be securely stored. Maintenance logs must be maintained in the asset management system so they are available to SBOE staff at all times.

2. QUARTERLY MAINTENANCE SUPPLIES

The following supplies are recommended for use when performing quarterly maintenance (please see vendor documentation for specific details):

- Asset Management System
- Compact Flash (CF) Cards with ballot definition loaded ES&S AutoMARK
- USB Sticks with ballot definition loaded ES&S DS200
- USB Sticks with ballot definition loaded ES&S DS850
- Security Seals (if applicable)
- DS200 Specific Supplies (see DS200 Maintenance Guide)
 - o Compressed air 10oz. can minimum
 - o Isopropyl alcohol 70% 16 fluid ounce bottle or more
 - Non lint-based cloth
 - Static mat with strap
 - o #1 Philips screwdriver
 - o #2 Philips screwdriver
 - o T-10 screwdriver with a security pin

- DS850 Specific Supplies (see ES&S DS850 Maintenance Guide)
 - o Compressed air 10oz. can minimum
 - o Isopropyl alcohol 70% 16 fluid ounce bottle or more
 - o Non lint-based cloth
 - Static mat with strap
 - Small hook
 - Blank ballot stock
 - o T-10 screwdriver
 - o T-20 screwdriver
 - o 5.5 mm nut driver
 - o 1.5 mm Allen wrench
- AutoMARK Specific Supplies (see ES&S AutoMARK Maintenance Guide)
 - o TORX Screwdriver #10
 - TORX Right Angle Screwdriver
 - o Compressed Air Can − 10 oz.
 - Anti-Static Cleaning Wipes
 - o Conductive, Non-Resistive White Lithium Grease
 - o Small Art Paintbrush

3. SUPPORTING DOCUMENTATION

The following procedures should be used during the Quarterly Maintenance Test (please see vendor documentation for specific details):

- DS200 Maintenance Guide
- ES&S AutoMARK Maintenance Guide
- ES&S DS850 Maintenance Guide
- Voting System Security Seal Procedure
- Hash Check Procedure ES&S DS200
- Hash Check Procedure ES&S AutoMARK
- Security Incident Response Procedure
- Test Deck Procedure
- ES&S Voting System 24-Month Archiving Procedure

4. QUARTERLY MAINTENANCE REPORTING

The SBOE requires that each CBOE maintain quarterly maintenance logs in their asset management system to be made available to the Election Operations Unit within ten (10) days of the quarter closing. The CBOE will use the asset management system to track and report the results of the quarterly maintenance. Once all quarterly maintenance has been performed, the CBOE must notify the SBOE Election Operations Unit for verification.

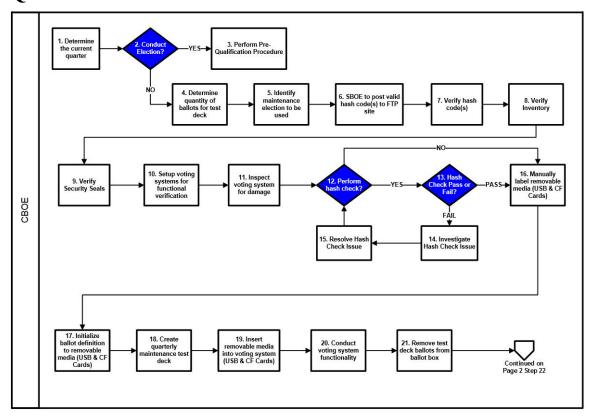
During a quarter when an election is held, the pre-qualification test (a.k.a. pre-election test) will meet the criteria for the quarterly maintenance test. The CBOE will use the asset management system to track and report the results of the pre-qualification test. The results of the pre-qualification test must be made available to SBOE within 48 hours of the completion of the test.

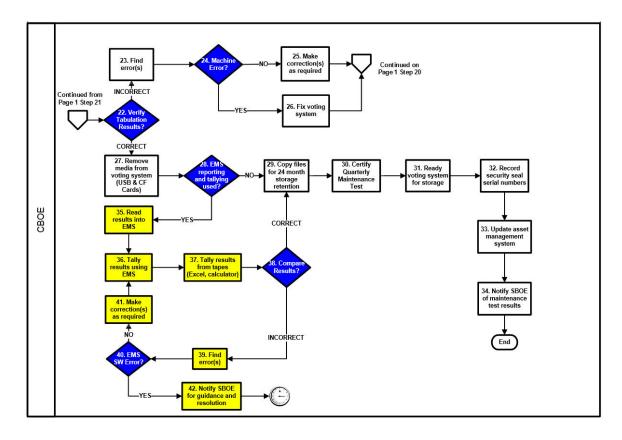
5. IMPLEMENTING MAINTENANCE PROCEDURES

The quarterly maintenance test process flow outlines the steps necessary to complete a quarterly maintenance cycle. Each step in the process flow is identified with a unique number that corresponds to a narrative describing the actions needed to complete the step. Many of the steps in the process flow can be implemented in parallel. Each CBOE many decide how to implement this process flow to best fit their needs.

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6. QUARTERLY MAINTENANCE PROCESS FLOW





7. QUARTERLY MAINTENANCE PROCESS DESCRIPTION

Process #	Description
1.	Determine the current quarter The CBOE shall determine in what quarter (timeframe) they are conducting the maintenance test. The quarter will determine whether the board must conduct the routine maintenance test, or will be conducting a pre-qualification test, as the tasks and level of maintenance testing for each are different.
	The SBOE requires quarterly maintenance to be performed during the following quarters:
	1. January 15 – April 15 (Pre-Qualification Test if holding any election)
	2. April 16 – July 15 (Pre-Qualification Test if holding any election)
	3. July 16 – September 15 (Pre-Qualification Test if holding any election)
	4. September 16 – November 15 (Pre-Qualification Test if holding any election)
2.	Decision Point: Conduct Election? If the CBOE will conduct an election in the current quarter Yes, then proceed to process step number 3. If the CBOE will not conduct an election No, then proceed to process step number 4.
3.	Perform Pre-Qualification Procedure The CBOE will perform the Pre-Qualification Test Procedure since an election is being held during the designated maintenance quarter.
	Note: As elections in which this voting system may be used, keep in mind that a Pre-Qualification Test can happen at any time.
4.	Determine quantity of ballots for test deck CBOE will determine the quantity of printed ballots required for maintenance test deck. The maintenance test deck is composed of 3 ballots (See Test Deck Procedure for marking of the ballots). Each BMD will require a blank ballot in order to perform the quarterly maintenance testing.
	Ballot #1 – Blank Ballot (same ballot may be used on multiple optical scanners and reused in future maintenance quarters) But #2 **Table
	• Ballot #2 – Hand marked scenario ballot (same ballot may be used on multiple optical scanners and reused in future maintenance quarters)
	Ballot #3 – BMD marked scenario ballot (a new ballot must be used on each BMD)
	 Steps to Determine Quantity of Ballots: 1. Verify if CBOE has any maintenance ballots on hand from previous maintenance test or elections 2. Determine the number of AutoMARK BMDs in inventory
	3. Order 1 ballot per AutoMARK BMD plus determine a number of spare ballots

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Process #	Description
	 Note: The number of maintenance test deck ballots will remain the same for each AutoMARK BMD therefore the CBOE may want to submit an order to cover multiple maintenance quarters. The CBOE may use the same ballots utilized in the County Receipt Procedure to conduct the Quarterly Maintenance Test since it is the same ballot definition provided by the SBOE therefore the CBOE may not need to order as many ballots. Maintenance Test Deck Ballot #1 and #2 may be reused for future maintenance quarters, so order accordingly The CBOE may use additional ballots for quarterly testing purposes, however if such a decision is made, the CBOE procedure must be so amended and filed with the SBOE.
5.	Identify maintenance election to be used The CBOE will identify the maintenance election to be used based on the number of ballots required to perform the maintenance test. The CBOE may use the same ballots utilized in the County Receipt Procedure, in a previous General Election or in a previous Primary Election to conduct the maintenance test.
6.	SBOE to post valid hash code(s) to FTP site The SBOE will post the valid hash code(s) that will be used by each CBOE to verify that the correct firmware / software is loaded on the voting system to the FTP site. The SBOE will e-mail instructions on how to download the hash code(s).
7.	Verify hash code(s) The CBOE will verify that they are in possession of the correct hash code(s) to be used in performing a hash check. If the CBOE has any issues in obtaining the latest hash code(s) the CBOE will notify the SBOE Election Operations Unit via e-mail, that they were unable to download the valid hash code(s) for the upcoming maintenance test, (election_ops@elections.ny.gov). Be sure to include the following in the subject of the email:
	Subject: <county name=""> - Unable to download hash code values.</county>
8.	Verify inventory CBOE will confirm the master serial numbers of each voting system by cross-referencing the asset management system. The CBOE will confirm that all components and accessories are accounted for by using the maintenance checklist from the asset management system.
9.	Verify security seals Each CBOE shall verify that all security seals are intact for each voting system. If any security seals show evidence of tampering or serial numbers are not correct or the CBOE has lost secure control of the voting system(s), the CBOE must perform a hash check on the voting system.
	CBOE secure control is defined as "a state of control of voting systems and election results when they are under possession and control of the CBOE. Possession and control means that only authorized individuals are permitted access to the voting systems and election results" If the CBOE's secure control is maintained, the CBOE use of security seals may be modified, and the

Process #	Description
	CBOE is directed to follow the steps defined by the Voting System Security Seal Procedure.
	If CBOE Secure Control is in place that assures the security of the testing facility (for details, see the Voting System Facility, Transportation and Storage Guidelines) then: • Security seals are optional and can be attached to the voting equipment at the completion of the tests (specific to each individual voting system).
	 If CBOE Secure Controls cannot be maintained (specific to each individual voting system) then: The CBOE shall place all required security seals on the voting system and record the security seal numbers in the log per the voting system transportation chain of custody procedure. If maintenance activities cannot be completed before the end of the day (specific to each individual voting system), the CBOE testers will resume maintenance activities only after validating that the security seals are intact from the previous day. Once all testing is complete (specific to each individual voting system), the CBOE shall place all required security seals on the voting system and record the security seal numbers in the log per the voting system transportation chain of custody procedure.
10.	Setup voting systems for functional verification The CBOE shall setup the voting systems according to vendor provided documentation and training. DS200 DS850 AutoMARK
	Note: CBOE should reuse their open ink cartridges when conducting the maintenance test. Follow vendor documentation on how to store ink cartridges when the system is not in use for extended periods of time.
11.	Inspect voting system for damage CBOE will inspect each voting system (including all components) for any signs of physical damage and clean any necessary parts per vendor recommendations. At a minimum, the inspection will verify the following:
	 DS200 Movable components (locks, doors, hinges) ADA Accessories Keys Physical Damage Cleaning components Power Cord
	 DS850 Movable components (locks, doors, hinges) Keys Physical Damage Cleaning components

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Power Cord AutoMARK BMD Movable components (locks, doors, hinges) ADA Accessories Cleaning components Cleaning components Cleaning components Cleaning components Cleaning components Power Cord Decision Point: Perform hash check Is a hash check required based on the results of step 9? If the selected voting system requires a hash check Yes, then perform a hash check on the voting system to ensure that the same firmware / software that was certified by the SBOE is currently installed and that no unauthorized software / firmware is present. Hash checks must be performe on the DS200 optical scanner, DS850 central count and AutoMARK hallot marking device (BMD). Proceed to process step number 13 when completed. If the selected voting system does not require a hash check No, then proceed to process step number 16. Note: A valid election must be loaded on the optical scanner and AutoMARK in order to perform a hash check. SBOE recommends that the CBOE provided Maintenance Election and Ballot configurations be used. See specific hash check procedure for details on how to perform hash check. 13. Decision Point: Hash Check Pass or Fail? If the selected voting system Passed the hash check, then proceed to process step number 16. If the selected voting system Failed the hash check, then proceed to process step number 14. Investigate hash check issue The CBOE will invoke the Security Incident Response Procedure. The CBOE shall have the following information ready regarding the voting system in question: Hash code value(s) being used Current firmware / software version of suspect voting system Maintenance Log (asset management system) 15. Resolve hash check issue CBOE will attempt to resolve the hash check issue. If successful, the hash check error must be entered upon the maintenance log of the voting system with the error. If unsuccessful, the CBOE entered upon the maintenance log of the voting system with the error. If unsuccessful, the CBOE	Process #	Description
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CBOE will attempt to resolve the hash check issue. If successful, the hash check error must be entered upon the maintenance log of the voting system with the error. If unsuccessful, the CBOE		Current firmware / software version of suspect voting system
hash check for the upcoming election.	15.	CBOE will attempt to resolve the hash check issue. If successful, the hash check error must be entered upon the maintenance log of the voting system with the error. If unsuccessful, the CBOE will notify the SBOE Election Operations Unit via email that a voting system did not pass the
Email: election_ops@elections.ny.gov Subject: <county name=""> Hash check failed</county>		

Process #	Description
- n	The CBOE shall have the following information ready regarding the voting system in question: • Hash code value(s) being used • Current firmware / software version of suspect voting system • Maintenance Log (asset management system)
	 TIP - Common reasons for failing a hash code check: Wrong hash code value(s) were used to compare against Voting system does not have the most current software / firmware installed Hash code verification procedure was not properly followed
16.	Manually label removable media (USB & CF Cards) The CBOE shall manually label the removable media to distinguish it as maintenance test removable media. The county may use their labeling methodology to ensure that proper identification has been made. Note:
	It is recommended that the CBOE purchase a sufficient number of removable media to conduct the maintenance test (example – 10 sets of media). The maintenance test removable media will be marked with blue labels indicating that these will be only used for maintenance testing. The removable media may be used on multiple machines by following the process flow.
17.	Initialize ballot definition to removable media (USB & CF Cards) CBOE shall initialize (write to) maintenance test ballot definition to the removable media that is inserted into the voting system. The CBOE will generate 1 complete set of removable media per voting system that will be used to conduct the maintenance test.
	Note: See vendor specifications for limitations.
	Voting System ES&S – DS200 Removable Media Required 1 – USB EQC (Clear Stick) 2 – USB Election Sticks 1 – USB – Reporting Stick
	ES&S – DS850 1 – USB EQC (Clear Stick) 1 – USB Election Sticks
	ES&S – AutoMARK 1 – CF Card Ballot Definition
	 Note: Blue Label: used for the maintenance test The removable media may be used on multiple machines by reinitializing the media after all testing in completed on a specific voting system
18.	Create quarterly maintenance test deck The CBOE shall follow the steps provided in the maintenance test deck instructions to create the test deck associated with the maintenance test election and ballot configuration. Each test deck ballot shall have the word "TEST" displayed on the ballot.

Process #	Description
	Note – Ensure the following:
	 test deck ballots are numbered and are in the correct order
	the word "TEST" is clearly displayed on the ballot
	• the voting system has not been compromised (i.e. chain of custody has not been lost)
	Options on how to mark "TEST" on the test deck ballots:
	Contract with the print vendor to print a "TEST" watermark on each test deck ballot
	Purchase multiple hand stamps configured with "TEST" to mark each test deck ballot
	Mark each test deck ballot by hand writing "TEST" on each ballot
19.	Insert removable media into voting system (USB & CF Cards)
	CBOE shall insert the assigned removable media from process step 17 into each specific voting
	system (DS200, DS850 and AutoMARK).
20.	Conduct voting system functionality
	The CBOE will conduct tests to ensure that the basic functions of each voting system are in
	working order. In addition to vendor-prescribed maintenance tasks and diagnostic tests, tests of
	voting equipment shall be conducted by the county board, on each piece of equipment owned by
	the county board. The voting system shall be tested to determine that the system is functioning
	correctly and that all system equipment, including but not limited to hardware, memory, and
	report printers, are properly integrated with the system and are capable of properly performing in
	an election. This is done to make sure that if any components fail that there is ample lead time to
	fix and test the voting system prior to use in any election. Use the maintenance checklist from the
	asset management system to perform the maintenance test.
	DS200 – optical scanner:
	Verify external battery charger indicator – Green / Flashing Amber / Red
	Initialize DS200 for election configuration (EQC stick)
	Load election definition
	Verify information on the Configuration Report
	Verify scanner is in "Admin Mode" Property of the Proper
	Perform Hardware Diagnostics Varify System Setting
	Verify System Setting Calibrate scanner touch screen
	o Set date and time
	Verify AC plug icon is present on the screen (upper right)
	Unplug wall power adapter cord and verify that the scanner continues to
	operate while displaying the battery status icon (plug scanner back in once
	verified)
	• Open polls
	 Print the following tapes and verify: Ballot Status Accounting Report
	o Zero Totals Report
	Cast test deck ballots
	Close Polls
	Print close polls report
	Verify vote totals
	Verify four (4) USB ports are functioning

Process #	Description
"	 EMS Reporting (Optional) Read results into EMS Tally results Verify vote totals correct (EMS & Close poll report tape)
	DS850 – central count scanner: • USB Port Test • Touch Screen Calibration • Load election definition • Open polls • Cast test deck ballots • Close Polls AutoMARK – BMD:
	 Verify battery charger indicator lights up Verify LED indicator is on Verify AutoMARK powers up Verify touch screen calibration Verify setting date and time Verify paper tray roller are in the correct orientation based on ballot size Verify Test Ballot Print Unplug power cord and verify that AutoMARK continues to operate on battery power (plug AutoMARK back in once verified) Cast ballots based on type of test: Verify Ballot Marking
21.	Remove test deck ballots from ballot box A CBOE testing team will remove the test deck ballots after the ballots have been scanned. It is recommended that the ballots are placed back in order.
22.	Decision Point: Verify tabulation results? If tabulation results are Correct, then proceed to process step number 27. If tabulation results are Incorrect, then proceed to process step number 23.
23.	Find error(s) CBOE testing team shall determine the cause of the tabulation error. If the system does not accurately count the votes from the test deck cast manually (aside from those that were deliberately designed to fail), or the calibration test, the cause or causes for the error or errors shall be ascertained and corrected. TIP: Review the test deck for stray marks Review your vote calculations
24.	Decision Point: Machine error? If the tabulation error was caused by a machine error Yes, then proceed to process step 26. If the error was not a machine error No, then proceed to process step 25.

Process #	Description
25.	Make correction(s) as required CBOE testing team shall make the required corrections to the test deck. The removable memory media shall be re-zeroed and the testing team shall proceed to process step 20.
26.	Fix voting system CBOE testing team shall fix the voting system, if possible and/or appropriate. If the issue discovered is a warranty issue, contact the voting system representative for further assistance. Once the voting system is back in working order, the removable memory media shall be re-zeroed and the testing team shall proceed to process step 20.
27.	Remove media from voting system (USB & CF Cards) CBOE testing team shall remove the media from the voting system being tested and place in designated area.
28.	Decision Point: EMS reporting and tallying used? If Yes, then proceed to process step number 35. If No, then proceed to process step number 29.
29.	Copy files for 24 month storage retention The CBOE EMS testing team shall copy the designated files into the county file repository per ES&S Voting System 24-Month Archiving Procedure.
30.	Certify Quarterly Maintenance Test The bipartisan supervisory team will sign off on the tabulation report indicating that the maintenance test was completed successfully without errors.
	The CBOE Commissioners will sign off on the Maintenance Certification Form designating that all voting systems have passed the quarterly maintenance test. The Maintenance Certification must be submitted to SBOE within 10 days of completing the Quarterly Maintenance Test.
31.	Ready voting system for storage The CBOE will ready the voting system for storage ensuring that all components have been accounted for and logged in the asset management system.
	The CBOE shall attach all required security seals to the voting system. If the CBOE's secure control is maintained, the CBOE use of security seals may be modified, and the CBOE is directed to follow the steps defined by the Voting System Security Seal Procedure.
32.	Record security seals serial numbers CBOE shall record the security seal numbers in the asset management system. If the CBOE's secure control is maintained, the CBOE use of security seals may be modified, and the CBOE is directed to follow the steps defined by the Voting System Security Seal Procedure.
	If CBOE Secure Control is in place that assures the security of the testing facility (for details, see the Voting System Facility, Transportation and Storage Guidelines) then: • Security seals are optional and can be attached to the voting equipment at the completion of the tests (specific to each individual voting system).

Process #	Description
	 If CBOE Secure Controls cannot be maintained (specific to each individual voting system) then: The CBOE shall place all required security seals on the voting system and record the security seal numbers in the log per the voting system transportation chain of custody procedure.
	• If Maintenance Test cannot be completed before the end of the day (specific to each individual voting system), the CBOE testers will resume the Maintenance test only after validating that the security seals are intact from the previous day.
	• Once all testing is complete (specific to each individual voting system), the CBOE shall place all required security seals on the voting system and record the security seal numbers in the log per the voting system transportation chain of custody procedure .
33.	Update asset management system CBOE will update the asset management system by filling in the appropriate fields.
34.	Notify SBOE of maintenance test results CBOE will notify SBOE when the Quarterly Maintenance Test is complete by emailing a copy of the Maintenance Certification. The SBOE requires that each CBOE maintain quarterly maintenance logs in their asset management system to be made available to the Election Operations Unit within ten (10) days of the quarter closing.
	Email: election_ops@elections.ny.gov
35.	OPTIONAL - Read results into EMS CBOE testing team shall provide the removable media to the CBOE testing team in charge of the EMS testing. The EMS testing team will read (upload) the results from the media to the EMS.
36.	OPTIONAL - Tally results using EMS CBOE EMS testing team will tally the results of the maintenance test deck using the EMS.
37.	OPTIONAL - Tally results from tapes (Excel, calculator) The EMS testing team will tally the results from the printed tapes produced by the optical scanner.
38.	OPTIONAL - Decision Point: Compare Results? If the results are Correct, then proceed to process step number 29. If the results are Incorrect, then proceed to process step number 39. Follow appropriate path.
39.	OPTIONAL - Find error(s) If the system does not accurately count the votes from the maintenance test deck, the cause or causes for the error or errors shall be ascertained and corrected.
40.	OPTIONAL - Decision Point: EMS software (SW) error? If there is a software error Yes, then proceed to process step number 42. If there is not a software error No, then proceed to process step number 41.

Process	Description
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41.	OPTIONAL - Make correction(s) as required
	CBOE testing team will make the appropriate correction as required.
	Note: Common causes of inaccurate totals are transposed numbers.
42.	OPTIONAL - Notify SBOE for guidance and resolution CBOE testing team will notify SBOE of EMS software error and hold for guidance and resolution to error.