

Specified Procedures report Electronic voting system



Halifax Regional Municipality

Special election for district 6

Advanced polling Specified Procedures

5 February 2016



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Report on results of applying Specified Procedures on the electronic voting system used during the advanced polling period for the Halifax Regional Municipality special election for District 6 - Harbourview - Burnside - Dartmouth East 2016

To the Returning Officer
Halifax Regional Municipality

As specifically agreed, Ernst & Young LLP ("we" or "EY") have performed the procedures detailed in Appendix A (the "Specified Procedures") in connection with the electronic voting system used during the advanced polling period for the Halifax Regional Municipality ("HRM") Special Election for District 6 - Harbourview - Burnside - Dartmouth East 2016.

The results of applying the Specified Procedures are set out in Appendix A. The Specified Procedures performed do not constitute an audit or review engagement and, accordingly, no assurance is expressed. Had we performed additional procedures, an audit or review engagement, other matters might have come to light that would have been reported. The sufficiency and appropriateness of the Specified Procedures described in this report are solely the responsibility of the Returning Officer. Consequently, we make no representation regarding questions of legal interpretation or regarding the sufficiency and adequacy of the Specified Procedures described in Appendix A, either for the purpose for which this report has been requested, or for any other purposes.

This report is intended solely for the purpose of assisting the Returning Officer in evaluating the electronic voting system used in the HRM Special Election for District 6 - Harbourview - Burnside - Dartmouth East 2016 during the advanced polling period. Any use that a third party makes of our report, and any reliance or decisions made based on it, are the responsibility of such third party. We accept no responsibility for any loss or damages suffered by any third party as a result of decisions made or actions taken based on our report.

Ernst & Young LLP

Halifax, Canada
5 February 2016

Chartered Professional Accountants

Note - This report is confidential and is intended solely for the use of the Returning Officer, Halifax Regional Municipality. It should not be provided to any other party without our prior written consent. Our report has not considered issues relevant to third parties and we shall have no responsibility whatsoever to any third party which obtains a copy of this report. Any use such a third party may choose to make of this report is entirely at its own risk. EY consents to HRM posting a PDF copy of this final Specified Procedures report on HRM's publicly accessible website, subject to the conditions as detailed in the original Statement of Work dated 8 December 2015.

Overview

Background

The Halifax Regional Municipality (“HRM”) engaged a third party, Intelivote Systems Inc. (“Intelivote” or the “software service provider”), to support the electronic voting process during the advanced polling period of the Special Election for District 6 - Harbourview - Burnside - Dartmouth East 2016. EY was engaged by HRM to perform Specified Procedures before, during and after the electronic voting portion of the advanced polling period.

The electronic voting availability during the advanced polling period was between 8:00 A.M. on 16 January 2016 and 7:00 P.M. on 21 January 2016.

Definition of terms used in this report

For ease of reading, certain terms, acronyms and abbreviations are used within the body of the report. These are explained below:

- ▶ **Active** - a state of the electronic voting system where the system is active and actual electronic voting is performed.
- ▶ **Auditor Module** - a module in the electronic voting system that is used to generate Auditor PINs, cast Audit votes before the advanced polling period and generate electronic voting results before, during and after the advanced polling period.
- ▶ **Auditor Module Zero Vote Count report** - electronic voting results generated just before the start of the advanced polling period to validate that no additional votes were recorded.
- ▶ **Auditor PIN/PINs** - PIN(s) that were generated using the electronic voting system’s Auditor Module, which were separately identified and segregated from the Voter PINs and used to perform the Specified Procedures.
- ▶ **.csv** (comma separated values) - format of the files obtained for the performance of the Specified Procedures.
- ▶ **Electronic voting** - voting via telephone or using a computer.
- ▶ **HRM municipal election management system** - the electronic system used to store data on the voters within the Halifax Regional Municipality.
- ▶ **Internet system** - a component of the electronic voting system used to support computer-based voting through <http://www.hrm.isivote.com> website.
- ▶ **ISI modules** - Intelivote System Inc.’s electronic voting system modules.
- ▶ **IVR (Interactive Voice Response) system** - a component of the electronic voting system used to support telephone-based voting through 1-888-360-7211 toll free number.

- ▶ **Loaded** - a state of the electronic voting system where the Auditor Module is active and can be used to cast Audit votes.
- ▶ **Oracle** - Oracle database management system of the electronic voting system.
- ▶ **PIN/PINs** - Personal Identification Number(s). This number, along with the date of birth, is used to login and vote in the electronic voting system.
- ▶ **USB** (universal serial bus) - storage media used to store the encrypted file extract containing the election results from the electronic voting system database.

Data files used in executing the Specified Procedures

HRM and Intelivote provided the following data files from their information systems to support certain Specified Procedures.

Organization	File name	File contents	As referenced in the Appendix A Specified Procedures
HRM	HRM_EMS_INTELIVOTE_EXPORT.csv	The HRM voter information recorded in the HRM system	Elector data extract HRM data extract
	CandidatesList.pdf	List of candidates from http://www.halifax.ca/election/CandidateList.php	Listing of all non-acclaimed candidates
Intelivote	ISIElectorFileExtract.csv	The HRM voter information generated from Intelivote (that were already loaded in the electronic voting system)	Software service provider data extract
	ISIPINFileExtract.csv	List of all PINs in the electronic voting system (assigned to voters and unassigned)	PINs

We relied on HRM and Intelivote to provide us with complete, accurate and reliable data files, as described above, on which we performed the Specified Procedures. We did not verify the completeness, accuracy or integrity of this data against any independent source other than as described in the Specified Procedures.

Appendix A - Specified Procedures on the electronic voting system used during the advanced polling period for the HRM Special Election for District 6 - Harbourview - Burnside - Dartmouth East 2016 and the results of the Specified Procedures

	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
1	<p>Obtain the elector data extract and the software service provider data extract.</p> <p>Sub-procedure A – Compare the total number of records (including totals for Name, Address, Date of Birth and District) for all records in the two data extracts.</p> <p>Sub-Procedure B – Enquire with the Halifax Regional Municipality Returning Officer as to the reason for any discrepancies.</p>	<p>Sub-procedure A – The total number of records for the elector data extract was 19,504, and the total number of records in the software service provider data extract was 19,504.</p> <p>Sub-procedure B – No discrepancies were noted in the total number of records (including totals for Name, Address, Date of Birth and District) in the two data extracts.</p>	X		

¹ Note - Electronic voting availability was between 8:00 A.M. 16 January 2016 and 7:00 P.M. 21 January 2016. The “Before” period is defined as the period between 11 December 2015 and the start of the electronic advanced voting period. The “After” period is defined as the period between the end of the electronic advanced voting period and 5 February 2016. The Specified Procedures were carried out at various times during these periods, as indicated in the Results tables and the results apply only to the particular time(s) indicated.

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
2	Using the HRM data extract noted in Procedure 1, randomly select a sample of 25 records and visually compare on screen that the Name, Address, Date of Birth, and District is consistent with data in the municipal election management system.	Name, Address, Date of Birth and District were consistent between the HRM data extract and the HRM municipal election management system for the sample of 25 records selected.	X		
3	Identify whether duplicate PINs exist in the data extract by reviewing the output of Intelivote's Oracle script test. As the PIN is the main index in the database and the index must be unique, the load will fail if each PIN is not unique.	There were no duplicate PINs noted.	X		
4	Obtain a listing of all system users who can access the electronic voting system (application, operating system and database). Note – ISI modules are included. Obtain representation from the Returning Officer, District 6 Special Election (application layer) and software service provider System Representative (database and operating system layers) that those listed users are appropriate.	Representations from the HRM Returning Officer, District 6 Special Election and Intelivote System Representative indicated that all listed system users of the ISI electronic voting system (application, operating system and database layers) were appropriate.	X		

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
5	<p>Obtain a listing of all non-acclaimed candidates and their districts from the municipality. Using Auditor PINs:</p> <p>Sub-procedure A – Visually inspect that all candidate names are set up in the Internet system and are assigned to the correct district.</p> <p>Sub-procedure B – Listen and validate that the candidate names are audible/set up in the IVR system and are assigned to the correct district.</p>	<p>Sub-procedure A – All non-acclaimed candidate names were set up and assigned to the correct district in the Internet system.</p> <p>Sub-procedure B – All non-acclaimed candidate names were audible/set up and assigned to the correct district in the IVR system.</p>	X		
6	<p>Attempt to log on to the electronic voting system via telephone to attempt to cast votes prior to the polling period.</p>	<p>Attempted to log on to the electronic voting system via telephone (1-888-360-7211) and noted that access was denied for the following times:</p> <ul style="list-style-type: none"> ▶ 16 January 2016 at 7:18 A.M. ▶ 16 January 2016 at 7:38 A.M. 	X		

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
7	Attempt to log on to the electronic voting system via Internet to attempt to cast votes prior to the polling period.	<p>Attempted to log on to the electronic voting system via Internet (http://www.hrm.isivote.com) and noted that access was denied for the following times:</p> <ul style="list-style-type: none"> ▶ 16 January 2016 at 7:20 A.M. ▶ 16 January 2016 at 7:41 A.M. 	X		
8	Attempt to log on to the IVR and Internet system with a PIN that is set to "disabled" status.	Access to the electronic voting system via IVR and Internet using a PIN that was set to "disabled" was denied.	X	X	

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
9	<p>In the loaded and active environment, perform pre-defined voting selections² and attempts for a population of audit voters.</p> <p>Validate the results match those that were expected from the pre-defined voting selections for the population of audit voters.</p> <p>Validate that the cast blank ballots did not enter into the election results as valid votes but as spoiled ballots.</p> <p>View the details of each audit ballot using the Auditor Module to verify the vote was counted as cast.</p>	<p>Audit voting election results matched those that were expected from the pre-defined voting selections for the population of audit votes.</p> <p>During electronic voting system sessions through IVR and Internet, blank ballots were not accepted and did not enter in the election results. The IVR system offered the selection for candidate names, spoil the ballot and decline to vote three times before the session was terminated. The Internet system required the voter to select at least one option of the candidate names, spoil the ballot or decline to vote. If submitted without a selection, the system provided an error message that indicated a selection had to be made.</p> <p>58 audit votes were cast and 58 votes were counted as cast.</p>	X	X	

² Please reference procedures 10-1 to 10-6 below for the pre-defined voting selections

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
10-1	Using Auditor PINs, cast a vote for each non-acclaimed candidate using the Internet system and IVR system. Observe that a vote could be cast for each non-acclaimed candidate.	A vote could be cast for each non-acclaimed candidate in the electronic voting system via Internet and IVR systems.	X	X	
10-2	Using an Auditor PIN that has already been used to cast a vote, observe whether additional votes can be cast and recorded in the electronic voting system with the same Auditor PIN. Sub-procedure A – Attempt to log on and vote for the same candidate as the original vote. Sub-procedure B – Attempt to vote for a different candidate in the same matter.	Sub-procedure A – Additional votes for the same candidate as the original vote could not be cast in the electronic voting system via the Internet or IVR systems for an Auditor PIN that had already been used to cast a vote. Sub-procedure B – Additional votes for a different candidate could not be cast in the electronic voting system via the Internet or IVR systems for an Auditor PIN that had already been used to cast a vote.	X	X	

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
10-3	<p>Using a computer that was already used to cast a complete electronic voting session, conduct two additional complete electronic voting sessions from the same computer using unused audit voter credentials.</p> <p>Observe whether the Internet system will record the electronic votes from three unique Auditor PINs using the same device.</p>	<p>The electronic voting system via Internet system recorded the unique electronic votes from the six audit voter credentials using the same device. Three audit voter credentials were used before the advanced voting period, and three audit voter credentials were used during advanced voting period.</p>	X	X	
10-4	<p>Using an Auditor PIN, complete an electronic voting session by voting in all eligible matters (District Councillor) using the IVR system.</p> <p>Using the same Auditor PIN, attempt to use the Internet system to conduct an additional complete electronic voting session by voting for the same candidates as voted for using the IVR system. Observe whether additional votes can be cast for those candidates.</p>	<p>An Auditor PIN was used for a completed electronic voting session in the electronic voting system via IVR and then could not be used to log on to the electronic voting system via Internet.</p>	X	X	

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
10-5	<p>Begin a voting session, using an Auditor PIN, vote for District Councillor and obtain confirmation of that vote.</p> <p>Disconnect from the system (disconnect access, hang up).</p> <p>Log back on to the system using the same credentials and observe whether the PIN is able to vote for the eligible District Councillor matter.</p> <p>Observe whether only one vote has been cast for the matter.</p>	<p>Using the Auditor Module via Internet and IVR during the loaded state and using the public channel via Internet and IVR during the active state, we were able to vote for a District Councillor; then upon disconnecting and logging back into the system, the system provided a message and did not allow a new vote, with only one vote being cast for that matter.</p>	X	X	

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
10-6	<p>Begin a voting session (Internet or IVR).</p> <p>Keep the session active.</p> <p>Using a different physical computer or IVR, attempt to log on to the system using the same set of credentials and observe whether the system will allow the log on.</p> <p>If allowed, attempt to cast a vote in each session.</p> <p>Observer whether only one vote has been counted.</p>	<p>The electronic voting session via Internet system was denied using the same set of credentials used for the active electronic voting session via IVR system.</p> <p>The electronic voting session via IVR system was denied using the same set of credentials used for the active electronic voting session via Internet system.</p>	X	X	
11	<p>Obtain the pre-election Auditor Module Zero Vote Count report from the software service provider's information system, and observe whether there are any votes recorded.</p> <p>The timing of this procedure is to occur within five minutes prior to the advanced polling period start time.</p>	<p>No votes were recorded in the Vote Count Summary Report prior to the advanced polling period start time.</p>	X		

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
12	<p>Visit one of the Advance Voting Kiosks.</p> <p>Select a voting terminal, record the allowable website(s) configured for that terminal.</p>	<p>Visited both the Dartmouth North Community Centre and Port Wallis United Church polling locations as there were only two advance polling locations for the by-election.</p> <p>Inspected the only available kiosk in the polling location with a voting terminal and observed that a voting screen was allowed and no address bar was available to access a website.</p>		X	
13	<p>Attempt to log on to the IVR system to attempt to cast votes after the electronic polling period has ended.</p>	<p>Attempted to log on to the electronic voting system via IVR system and noted a message indicating "You have reached the HRM District 6 Special Election. Voting in this event has concluded. Thank you."</p>			X
14	<p>Attempt to log on to the Internet system to attempt to cast votes after the electronic polling period has ended.</p>	<p>Attempted to log on to the electronic voting system via Internet system and noted a message indicating "Sorry, this Event has concluded."</p>			X

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
15	<p>At the close of the electronic advanced polling period (21 January 2016, 7:00 P.M.), observe the following:</p> <p>1. Intelivote will create an extract file from their database containing the election results. This file will be encrypted and written to two separate USB flash drives. Obtain one copy and observe that the other copy has been provided to the Returning Officer. The password will only be provided to the Returning Officer.</p> <p>2. The Auditor will create a printed report of the election results and will place this in a sealed envelope, and signatures of the Returning Officer and the Auditor will be applied to the seal area. This report will be provided to the Returning Officer.</p>	<p>Observed that Intelivote created an extract file from their database containing the election results. Observed that the file was encrypted and written to two separate USB flash drives. Observed that the Returning Officer entered the password during encryption and the password was not shared to anyone. Obtained one of the USB flash drives and observed that the other copy had been provided to the Returning Officer.</p> <p>The Auditor generated the printed report of the election results and placed the report in the sealed envelope without revealing the results to the Intelivote personnel and HRM Returning Officer, District 6 Special Election. The Auditor signed the sealed area of the envelope and the Auditor observed the Returning Officer signing the same sealed area. The Auditor observed that the sealed envelope was provided to the Returning Officer.</p>			X

	Specified Procedures	Results	Timing and occurrence of Specified Procedures		
			Before	During	After
16	<p>Election Close (23 January 2016, 7:00 P.M.): After the close of the election.</p> <p>The Auditor, using the Auditor Module, will print off the election results using their ID, and compare the electronic voting results they just printed with the electronic voting results from the RO's report printed earlier at the close of the advanced voting on 21 January 2016.</p> <p>The vote counts should be equal, demonstrating no additional votes were added to the system since the advanced voting period ended.</p>	<p>Using the Auditor Module, generated and printed the election results using the Auditor's ID on 21 January 2016 at 7:07 P.M. Observed the Returning Officer open the sealed envelope. Compared the electronic voting results from the sealed envelope with the electronic voting results printed at the close of the advanced voting and noted that the vote counts were equal, demonstrating no additional votes were added to the system since the advanced voting period ended.</p>			X