

**AUDIT REPORT SUMMARY**

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**Client:** ACT Electoral Commission  
PO Box 272  
Civic Square  
ACT 2608

**Manufacturer:** Software Improvements Pty Ltd

**Product Name:** eVACS Count source code as at 08/10/2020

**Date of Issue:** 08 October 2020

**Project Number:** ACTEC.1005

**BMM Test Report:** ACTEC.1005.01 2020 eVACS Count

**Standards Tested to:** N/A

**Issues/Observations:** See Observations

**BMM Certification:** N/A

**Auditor:** **Johnathan Shaw, Senior Consultant, BMM Testlabs**

**Auditor Signature:** \_\_\_\_\_

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## 1 PURPOSE OF EVALUATION

The ACT Electoral Commission (ACTEC) requested BMM to audit source code for the “Count module” of eVACS, the electronic voting and counting system, for the 2020 election.

The “Voting modules” and “casual vacancy module” are outside the scope of this certification. The voting modules are the subject of a separate audit of source code.

## 2 BMM EVALUATION PERFORMED

ACTEC provided the following eVACS count module components for Audit.

- Documentation and
- Count module Source Code (supplied 2/9/2020 with updates 30/9/2020, 07/10/2020, 08/10/2020)

BMM reviewed design documentation and performed a source code review of the above revised eVACS software “Count module”.

## 3 DESCRIPTION OF SYSTEM

The count module resides on the election server of the eVACS system.

The **polling place server** manages voting at a polling centre, enabling authorised officers to start and stop voting, check barcodes, authorise voters to cast a (single) vote and to manage the electronic ballot boxes.

The **polling place client** allows voters to enter preferences securely and anonymously and collects votes into secure electronic ballot boxes.

The **data entry client** enables manual entry of paper ballots and maintenance of ballot batches.

The **election server**

- Imports the electorate and candidate configuration from the TIGER EMS (Election Management System) system
- Installs the polling place/telephone server’s software, including Operating System and election configuration on the computers used for servers.
- Counts votes and produces reports on the outcome of the election as well as audit reports to ensure accuracy and integrity of the election contest database.
- Runs casual vacancy recount.

The major changes in the count software since the 2016 audit were:

- The eVACS count module has now been re-written from “C” computer language to the “Ada 2012” computer language. The ADA code implements commands to activate the various stored procedures within the election PostgreSQL database system database on the Election Server. The main work of counting is done by the stored procedures. No particularly complex Ada code has been created.
- Implement change to Electoral Act 1992 where surplus votes are transferred at a value including 6 decimal places, rather than as whole votes rounded down. As per below “*Schedule 4- 1A Meaning of count votes—sch 4*”

*“(1) For this schedule, count votes, in relation to a candidate, means the number of votes worked out as follows: BP x TV*

*(2) Any fraction must be rounded down to 6 decimal places.*

*(3) In this clause:*

*BP means the number of ballot papers to be dealt with at a count that record the next available preference for the candidate.*

*TV means the transfer value of those ballot papers.”*

## 4 EVALUATION OF TESTING

N/A - BMM did not perform tests on the current software version.

## 5 SOURCE CODE EVALUATION

Using the documentation as a guide each module was checked. It was not the purpose of the review to verify that the code works correctly, rather it was to verify that the code matched the documented scope of the eVACS system and that no malicious code had been introduced that could insert, alter or delete ballot information unlawfully.

## 6 OBSERVATIONS

6.1 A Surplus is defined in the *“Electoral Act 1992 – Schedule 4.1 as **“surplus”**, in relation to a successful candidate, means the candidate’s total votes less the quota, if the resulting number of votes is 1 or greater”*.

The ACTEC confirmed with BMM that the **bolded** text above is a drafting deficiency in amending the act for 6 decimal places. To be consistent with vote values to 6 decimal places a **“surplus”** is accepted as “any count greater than the quota and the minimum surplus that can be calculated has a vote value of 0.000001. Hence the expected system behaviour is to transfer any surplus calculated.

## 7 FINDINGS

Following the audit activities outlined in this report, the Auditor was able to make an informed appraisal of the integrity of the eVACS source code as at 07/10/2020.

The Auditor’s findings were as follows:

- The code has been written in a modular fashion.
- Library packages used by the count were confirmed as
  - standard libraries surrounding the Ada Standard are all written by AdaCore the supplier of the Ada Compiler and integrated development environment.
  - specialised libraries written for communication with SQL databases
- There is no evidence in the source supplied of malicious code that can insert, alter, or delete ballots or otherwise alter the election result.

As a result of the evaluation BMM believes the eVACS “Count module” code as at 08/10/2020 is suitable for use in the 2020 elections.