Elections ACT

ACT ELECTORAL COMMISSION OFFICERS OF THE ACT LEGISLATIVE ASSEMBLY

Ballot paper scanning assurance plan

Draft version 0.3

November 2023

Nara Centre
3 Constitution Avenue, Canberra City

Phone: 02 6205 0033
PO Box 272, Civic Square ACT 2608

elections@act.gov.au
www.elections.act.gov.au

© Australian Capital Territory, Canberra 2023

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without written permission from the Territory Records Office, ACT Government, GPO Box 158, Canberra City ACT 2601.

Produced by the
ACT Electoral Commission
GPO Box 172, Canberra City ACT 2601.
Phone: 02 6205 0033
Web: www.elections.act.gov.au
Email: elections@act.gov.au

Publication date: November 2023

Contents

Introduction **4**

Background 4

Aim 5

Ballot paper scanning system (BPSS) **5**

Ballot paper scanning assurance plan **6**

Introduction 6

Sample selection 7

Randomised selection 7

Assurance testing 7

Review of potential exceptions 8

Report creation 9

Introduction

Background

The ACT Electoral Commission (the Commission) is an independent statutory authority established under the *Electoral Act 1992* (the Act) with responsibility for the conduct of elections and referendums for the ACT Legislative Assembly and for the provision of electoral advice and services. The next ACT Legislative Assembly is scheduled for October 2024.

Elections in the ACT have traditionally demonstrated high levels of accessibility, inclusivity, turnout, speed and accuracy of count and voter satisfaction. As a result, the Commission enjoys a high level of trust from both voters and political parties and candidates alike. Trust in electoral authorities is hard-earned and easily lost. The Commission is determined that high levels of trust and satisfaction with electoral services provided by Elections ACT continue into the 2024 election and beyond.

A defining characteristic of Elections ACT is its reliance on innovative ICT enabled electoral systems across the full range of electoral operations. Ensuring a high level of functionality, security, integrity and reliability of the Commission's electoral ICT systems and processes will be critical in continued public confidence and trust in election outcomes.

One key system is the ballot paper scanning system (BPSS). The BPSS digitally captures voter preferences from paper ballots including postal votes, declaration votes and ordinary votes issued at a polling place. The BPSS system, which was established for the 2008 ACT Legislative Assembly elections, has proven effective in successfully capturing voter preference data in a digitised format across four ACT Legislative Assembly elections (2008, 2012, 2016 and 2020).

Following each of these elections, Elections ACT has conducted an internal audit process, assessing the digital preferences attributed to ballot papers randomly selected for the audit, and comparing them against the digitally captured image of that ballot paper. Elections ACT conducts the audit of the scanned ballot paper images to verify the accuracy of the system.

Following the 2008 election, the audit found one case only of an incorrect interpretation of preferences that was the result of the system itself. As a result, the vendor was contracted to enhance the system for future elections to eliminate the specific issue identified from being repeated. A very small number of other incorrect preference interpretations were discovered in the 2008 audit that were the result of operator error. Using the experience of the 2008 election, changes were made to operational procedures around the scanning system to address the issues found. No incorrect preference interpretations have been identified since the 2008 election.

This BBPS audit process has been conducted by Elections ACT after the conclusion of the ballot paper count.

Elections ACT is now seeking to further demonstrate the accuracy and integrity of the scanning system through deployment of a 'live' ballot paper scanning assurance process, conducted by an independent third-party and open to party and candidate scrutiny.

The assurance process is aimed at demonstrating the integrity of the BPSS to accurately capture handwritten voter preferences and provide assurance as to the validity of electronic preference data exported from the BPSS into Election ACT's electronic counting system (eVACS).

The outcome of this audit will be made publicly available.

Aim

This plan outlines the process for the ballot paper scanning assurance project. The plan first provides a brief overview of the scanning system before discussing delivery of the assurance project in more detail.

The aim of the ballot paper assurance process is to ascertain whether the election outcome is based upon an accurate capture, interpretation and verification of handwritten vote preferences from physical paper ballots. Through this process the assurance process should be capable of concluding that the error rate is insignificant as to ensure a trusted outcome or to highlight that errors may be numerous enough to have potentially impacted the final outcome.

Ballot paper scanning system (BPSS)

All formal ballot papers are parcelled at each polling place or counting centre relating to first preferences counted to a particular candidate.

At the central scrutiny centre, starting on the Sunday after polling day, formal ballot papers for each polling place are counted into batches of 100 papers. Each batch is allocated a batch header with a unique batch number related to that polling place. Each batch is then scanned and imaged, and the image read by intelligent character recognition (ICR) software.

The ICR software interpreted the preferences shown, and the Robson rotation version number printed, on each ballot paper.

The scanning system uses a range of strategies to ensure that preferences are captured with 100% accuracy.

After each batch of ballot papers is scanned, Elections ACT operators are presented with an image of each preference number on each ballot paper, and conducted an initial validation check on the accuracy of the scanned results (for example, by checking every "1" on every ballot paper, every "2" on every ballot paper, and so on).

After this initial check, the ICR software applies a set of business rules to each ballot paper. Those ballot papers that the ICR software interprets with a high level of certainty pass the business rules check and are automatically admitted for counting. Any ballot papers which have unclear numbers, or do not pass the business rule check (for example having a break in the sequence of numbers, or appearing to be informal), are flagged as requiring the verification of an Elections ACT officer.

The Elections ACT officer investigates each ballot paper requiring verification by comparing the on-screen image of the ballot paper with the ICR interpretation of the preferences on the original

ballot paper to determine whether there has been any error in scanning, interpretation or validation.

The Elections ACT officer corrects any identified errors in scanning, interpretation or validation on the computer system. If necessary the officer views the physical ballot paper if the scanned image is not sufficient to resolve any doubt.

If an Elections ACT officer changes a record of a vote on-screen, that change has to be verified by a second Elections ACT officer.

Scrutineers are entitled to observe the scanning, validation and verification processes, and where a scrutineer believes that a ballot paper has been incorrectly interpreted, the interpretation can be challenged. Challenged ballot papers are re-examined by a senior electoral official.

The above process continues until all formal paper ballots have been scanned and all ballot papers verified.

Once all scanned ballot papers are verified, the preference data from those ballot papers is transferred to the electronic voting and counting system (eVACS), where the data is combined with the results of the electronic voting, and the computer program distributes preferences under the ACT's Hare-Clark electoral system.

All ballot papers identified at the manual count at the polling place as informal are manually rechecked at the central scrutiny centre. Any papers ruled at that stage to be formal are added to a new batch and scanned as formal. Ballot papers confirmed as informal are also scanned but their markings are not recorded in the system.

Ballot paper scanning assurance plan

Introduction

Elections ACT will deploy a ballot paper scanning assurance process during the 2024 ACT Legislative Assembly election live scrutiny. The ballot paper scanning assurance process may be inspected by scrutineers at the counting centre where ethe scrutiny is being conducted. The assurance process will engage an external assurance provider to conduct the assurance process using an ICT system developed by Elections ACT.

The assurance plan consists of four components: sample selection, assurance testing, review of potential exceptions and report creation/publication.

Each of these components is described below.

The stakeholders involved in the ballot paper assurance process include:

- Elections ACT Executive (Electoral Commissioner and Deputy Electoral Commissioner);
- Elections ACT permanent and casual staff;
- Ballot paper scanning system vendor (Ive Group) staff; and
- External assurance provider staff.

Sample selection

Ballot paper selection will be randomised. Election ACT's ballot paper assurance system (BPAS) will include a randomisation algorithm involving the input of a randomly selected seed. The selection of the seed will occur prior to the commencement of ballot paper scanning at Elections ACT's scrutiny centre.

Five separate ballot paper audit processes will be conducted simultaneously. One audit per electorate.

Sample selection will occur at Election ACT's scrutiny centre. The external independent ballot paper assurance team will decide a number of batches to be randomly selected from the pool of available batches. Based on the randomisation process, a physical batch of ballot papers that has undergone the full verification process will be identified and within that batch, a random starting ballot paper will also be identified. The TIGER system will generate a report listing the randomly selected batches and starting ballot paper. The report will be provided to EACT staff to retrieve the batches for the ballot paper assurance team. Physical identified batches will then be provided to the assurance provider for analysis.

Elections ACT has engaged the services of the Australian Bureau of Statistics (ABS) to provide a tool to assess the appropriate sample size to be selected for statistical assurance purposes. The ballot paper assurance process will use the tool to determine the statistically acceptable sample size.

The statistically derived sample size enables Elections ACT to calculate the estimated error rate across the full digitisation of ballot papers and to use this rate to derive a confidence level as to whether the election outcome has been impacted by errors in digital preference capture.

Randomised selection

The BPAS has been designed to accept a randomly generated seed to feed into the randomisation algorithm. This seed will be determined at the commencement of the assurance process in an open process available to be witnessed by candidate scrutineers. A 'raffle machine' will randomly generate a seed between 1 and 1,000.

Based upon the statistically derived sample size, Elections ACT's BPAS will randomly select ballot paper batches from the available inventory of verified and 'committed to count' batches. From within each selected batch, the system will also generate a random ballot paper from which to commence a cluster sample of five ballot papers.

For example, batch number 1092001-1 has been randomly selected along with paper 23 from within that batch. 1092001-1 will be retrieved from the secure ballot paper storage facility and provided to the external assurance team for analysis. Paper 23 will be identified and assessed. Paper 24 for then be assessed, paper 25, paper 26 and paper 27. The external assurance team will then move on to the next randomly selected batch and the next five papers.

Assurance testing

The ballot paper scanning and verification process will commence on the Monday following election day, 21 October 2024. Due to the time required for full batches to be digitised, fully verified and committed to count, it is unlikely that a suitable quantity will be available for assurance processes until Tuesday, 22 October 2023. Accordingly, the scanning assurance process will commence on the second day of scrutiny activity.

To conduct the scanning assurance process, external audit staff will use Elections ACT's Ballot Paper Assurance System linked to a file of scanned ballot paper images and their stored digital preferences. Viewing monitors will be provided to facilitate scrutineer observation.

Assurance testing will be undertaken using a two-stage checking approach:

- The first stage will assess the completeness and accuracy of the scanned image against the physical ballot paper. Assessors will validate that all marks on the scanned image are an exact replica of the marks on the physical ballot paper.

- The next step of this analysis will be ensuring that the correct Robson Rotation variation has been captured and applied. This is a critical part of the process, any incorrect Robson Rotation allocation will inadvertently allocate the determined preferences to unintended candidates.

- Once an exact match has been confirmed, the third stage will assess the physical ballot paper against the digital preferences determined through the ballot paper scanning verification process. Each preference will be assessed to ensure that it has been assigned to the correct candidate according to the preferences recorded on the physical ballot paper and that no preferences recorded on the paper ballot have been missed.

If a full match is determined and confirmed, the assessor will mark the ballot paper record within the BPAS as checked and accurate.

If discrepancies are identified, the assessor will complete an error report for that ballot paper.

Note: Throughout the ballot paper verification process, where doubt has been raised in association with a particular marking on a ballot paper, a small sticker will be placed adjacent to the mark with the preference determination made by a senior Elections ACT officer. The external assurance team will not be making judgements on previously adjudicated interpretations. As such, comparisons of digitally recorded preferences will be made against the number recorded on the sticker and disagreements will not be marked as errors.

Review of potential exceptions

To provide a greater level of confidence over potential exceptions identified, all potential exceptions will be subject to review by the Deputy Electoral Commissioner or Electoral Commissioner. The purpose of this review is to confirm how Executive officials would apply the business rules for interpretation of voter intent.

If the review by the Executive would result in an interpretation of the ballot paper that differs to that which has been recorded in the BPSS, an official error will be recorded.

Report creation

At the completion of the ballot paper assurance process, after all ballot papers have had the opportunity to be randomly selected and undergo external assurance, the auditor, following the ABS guidance, will calculate the error rate and confidence interval for each electorate.

The confidence interval will then be applied against the number of votes cast allowing a comparison with the apparent margins for each election result.

As soon as practicable after the completion of the scrutiny, the Electoral Commissioner will publish a statement ballot paper assurance outcomes.