

IRV testing protocol

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Summary: The basic procedure is to run a test deck through pieces of voting equipment, ensure that ballot images are being accurately stored, perform the IRV tabulation and ensure that vote totals by candidate and by round of counting are accurate.

Steps:

1. Develop one or more test decks that cover every ballot position, all types of voter errors, and a healthy variety of ballots that count in the final round and that exhaust at very stages of counting. This should be tested with non-IRV contests as well as ballot measures, and it should include multiple precincts and ballot types, including ballot rotations.
2. Run a test deck of ballots through several pieces of voting equipment, including including different precincts and ballot rotations.
3. Compare 1st choice vote totals by machine to pre-determined vote totals (paper printouts, memory packs, etc)
4. Compare the ballot images stored by the equipment with the pre-determined pattern from the test deck. This can be done ballot by ballot, at the precinct level, and at the aggregate level
5. Perform IRV tabulation, keeping track of vote totals for each candidate and exhausted ballots by round until a candidate is elected.
6. Analyze vote totals on a precinct basis by candidate and by round and compare them to the pre-determined results

Other issues:

1. 1% manual tally
 - a. Can manually create electronic record of all ballots in chosen precincts and compare them.
 - b. Can manually count the ballots in the specified precincts, based on the elimination order to verify vote totals by candidate by round
2. Complete manual count
3. Handling write-ins
 - a. Need to inspect write-ins to make sure they are qualified. If not, they are treated as an undervote, and the ballot transfers.

Audit record consists of:

1. Original paper ballots (op-scan) or voter-verified paper trails
2. Data files consisting of ballot images for each precinct
3. Printout of raw 1st choice totals at close of polls
4. "Cleaned" 1st choice totals (when you interpret each ballot for a valid vote: ie, if a ballot skips a 1st choice but lists a 2nd choice, then the "cleaned" ballot counts for the 2nd choice candidate listed.

5. An aggregated data set consisting of ballot images for all ballots cast in race
6. Vote totals by candidate, including exhausted ballots and total valid ballots, by round, until a candidate is elected.
7. For each precinct, the number of votes in that precinct credited to each candidate in each round of counting, based on the sequential elimination of candidates.

Thus, for each individual ballot paper (or electronic record of a ballot, or a voter-verified paper trail), it should be possible to identify an electronic record of that ballot and how that ballot was counted in each round of counting (in other words, which candidate the ballot counted for in each round).

Problem ballots:

1. Overvotes for a choice
2. Same candidates listed for more than one choice (e.g., same candidate 1st and 2nd)
3. Skipped ranking
4. Combinations of these

Example: see Excel spreadsheet

- Data file for 2 precincts
- Raw 1st choice totals by candidate
- Cleaned, round-by-round totals
- Round-by-round totals by precinct