Status Updates

- **Cast Vote Record CDF**
  - Current version needs improvement: desire to simplify further, concerns regarding complexity in tabulation and audit, probably won’t get adopted as is, proposed updates are relatively easy to make – let’s do it!
  - Revisiting use cases and assumptions
    - For easy import into tabulators, e.g. for RCV
    - Easy import into EMS, adjudication and audit apps
    - To serve as a general, interoperable format for archive and other purposes.
    - More here... revisit PowerPoint
  - Note: almost all complications with the CVR CDF results from handling manually-marked paper ballots. Marks can be ambiguous, margin, valid, valid only after human inspection.
  - The CVR CDF needs to show the scanner’s “though process” in decisions it makes based on scanner and contest rules.

- **Current CVR CDF version summary**
  - Current version contains one CVR version per ballot sheet scanned.
  - History is accounted for by tagging each mark with a status. It gets complicated because it accounts for changes made by the scanner, changes made as a result of adjudication.
  - Annotations can apply to:
    - Individual marks, whether made by voter or scanner
    - Entire contest selection
    - Entire contest
    - Entire CVR
  - Feeling that it could be tough to audit because it may be hard to see what the changes are, recreate the actions

- **Summary record**
  - With minor modifications the current CDF could also serve as the summary report from the scanner. Is this useful? Election results reporting CDF can also serve as a summary record. Should a scanner device have to support two CDFs? Answer may depend on what the summary record contains besides vote counts and IDs of election.
  - What else does the summary record contain that isn’t in 1500-100. Will have a dedicated phone call on this.

- A change in terminology
Current CVR CDF uses “mark” to mean both (a) marks made by humans on the ballot as well as (b) generated markings made by the scanner in the CVR.

In the next version “mark” is more narrowly defined as being made solely by a human on a piece of paper; CVRs do not contain marks, paper ballots contain marks.

Indications of contest selections made by the scanner as it scanned the paper is now called Contest Selection Indications (CSI).

For simplicity, multiple versions of a CVR
- Current version maintains one CVR per ballot sheet and you must read statutes to determine its history.
- A less complicated method is to include multiple versions of a CVR:
  - Original – as scanned, before election results, contains only indications of mark quality, not tabulatable.
  - Modified – after election rules are applied, contains indications as to whether certain CSIs are countable or not, overvotes/undervotes, generated CSIs due to contest rules, tabulatable
  - Adjudicated – contains changes as a result of adjudications, tabulatable.
    - Or, the modified version could just be tagged with adjudications.
- Important thing is preserving the scanner’s interpretation of the original so that it’s not overwritten.

Simplify the way in which various status flags are used.
- Due to complexities of interpreting hand-marked paper ballots, current version maintains various statuses for:
  - CSIs – ambiguous, marginal, valid countable, was generated
  - Contest selections – overvoted/undervoted, needs adjudication, adjudicated
  - Contests – overvoted/undervoted, invalidated, adjudicated
  - Entire CVR
- Status flags are currently used for tabulation, summary stats, and adjudication.
- Almost everything is optional, so there are ways to accommodate different types of devices (all-electronic, for example).
- Proposal is to make statuses informative and not needed for tabulation:
  - For tabulations, a simple Boolean-type flag to indicate if a CSI is countable or not or needs adjudication.
  - Audit, adjudication, or stats collection can look further at the statuses as needed.

Why maintain statuses?
- Mainly useful for the modified version of the CVR
- Also for creation of summary statistics and auditing.
- Do we really need all of these statuses?

CSI status – what is necessary?
- What we current have:
  - Does it represent a valid mark made by a voter?
    - Countable?
    - Not countable because it didn’t observe election rules?
  - Is it a machine-generated CSI and thus countable?
- Is it marginal?
- Is it ambiguous and needs adjudication?
- Is it adjudication-generated and countable, or adjudication-invalidated and not countable?
- Is it a write-in?
- Anything else?
  - Maybe not all statuses are necessary for tabulation, but are necessary for audits.
  - Kim: at least want to have a date/time stamp.
  - Is this the right set of questions? Do we need others? Are there too many?
  - Herb: what’s the difference between marginal and ambiguous
    - Maybe don’t need ambiguous – marginal covers it.
    - John McCarthy: marginal marks are made outside the target area.
    - John D: marginally machine readable is the term Election Modeling decided on.
  - Harvie: the point of this is to offer transparency on the adjudication that happens during tabulation and also during the auditing process.
- Contest selection status – what is necessary?
  - Overvoted or undervoted? Could be determined by looking at the CSIs.
  - Was it entirely invalidated because of contest rules?
  - Does it require adjudication, e.g. a write-in?
  - Was it added or invalidated because of adjudication?
  - Is it a write-in?
  - Anything else?
  - Dwight, with the more expansive view of “audit” feels that these provide useful information.
- Contest status – what is necessary?
  - Is it overvoted or undervoted? Could also be determined by looking at the CSIs or contest selections.
  - Was it machine generated or invalidated? Again, for variations with multiple marks possible, it could be both.
  - Ditto for adjudication?
  - Was it voted or not?
    - Different states handle blank ballots in different ways, so may be hard to incorporate those.
    - Herb: a blank ballot is just an additional statistic.
    - Is there a CVR created for a blank ballot? yes.
  - Anything else?
- CVR status – what is necessary?
  - Is it the original or modified version?
  - Is it the version that gets tabulated?
  - Was it tabulated and included in the device summary?
  - Does it need adjudication?
  - Was it adjudicated?
  - Is it blank?
  - Is it not valid in some other way?
Anything else?

- Harvie: it’s important to know in the course of processing and auditing ballot – it has been reviewed by a person. Also allow a voter to indicate that it needs to be hand-reviewed because they know there is something strange – a scribble or a cross-out, etc.