**Test Assertions for VVSG 1.1, Volume 1, Section 7.8.4**

**September 23, 2016**

**VVSG 1.1, Vol 1, Requirement 7.8.4:** **Equipment Security and Reliability**

1. The VVPAT printer **shall** be physically connected via a standard, publicly documented printer port using a standard communications protocol.
2. Tamper-evident seals or physical security measures **shall** protect the connection between the printer and the voting machine.
3. If the connection between the voting machine and the printer has been broken, the voting machine **shall** detect this event and record it in the system event log.
4. The VVPAT voting system **shall** detect printer errors that may prevent paper records from being correctly displayed, printed or stored, such as lack of consumables such as paper, ink, or toner, paper jams/misfeeds, and memory errors.
5. If a printer error or malfunction is detected, the VVPAT voting system **shall**:
6. Present a clear indication to the voter and election officials of the malfunction. This must indicate clearly whether the current voter’s vote has been cast, discarded, or is waiting to be completed;
7. Suspend voting operations until the problem is resolved;
8. Allow canceling of the current voter’s electronic ballot image by election officials in the case of an unrecoverable error; and
9. Protect the privacy of the voter while the error is being resolved.
10. Procedures for recovery from printer errors on paper-roll VVPAT voting systems **shall** not expose the contents of previously cast paper records.
11. Paper-roll VVPAT voting systems **shall** be designed so that when the rolls are removed from the voting device according to the following:
    1. All paper records are contained inside the secure container;
    2. The container supports being tamper-sealed and locked; and
    3. The container supports being labeled with the device serial number, precinct, and other identifying information to support audits and recounts.
12. If a continuous paper spool is used to store paper records, the manufacturer **shall** provide a mechanism for an auditor to unspool the paper, view each paper record in its entirety, and then respool the paper, without modifying the paper in any way.
13. The printer **shall** not be permitted to communicate with any system or machine other than the voting machine to which it is connected.
14. The printer **shall** only be able to function as a printer; it **shall** not contain any other services (e.g., provide copier or fax functions) or network capability.
15. Protective coverings intended to be transparent on voting equipment **shall** be maintainable via a predefined cleaning process. If the coverings become damaged such that they obscure the paper record, they **shall** be replaceable.
16. The paper record **shall** be of sufficient durability to remain unchanged for minimally 22 months to be used for verifications, reconciliations, and recounts conducted manually or by automated processing.

**Test Assertions**

**TA784a-1:** The VVPAT printer SHALL be physically connected via a standard port.

**TA784a-2:** The VVPAT printer SHALL be physically connected via a publicly documented port.

**TA784a-3:** The VVPAT printer SHALL use a standard communication protocol.

**TA784b-1:** The connection between the printer and the VVPAT voting machine SHALL be protected by using EITHER 1) Tamper-evident seals OR 2) tamper-resistant measures.

**TA784c-1:** IF the connection between the VVPAT voting machine and the printer has been broken, THEN the VVPAT voting machine SHALL detect this break in the connection.

**TA784c-2:** IF the connection between the VVPAT voting machine and the printer has been broken, THEN the VVPAT voting machine SHALL record this break in the system event log.

**TA784d-1:** The VVPAT voting machine SHALL detect errors/malfunctions including, but not limited to, paper jams/misfeeds, memory errors, or lack of consumables such as paper, ink, or toner, that may prevent paper records from being correctly displayed.

**TA784d-2:** The VVPAT voting machine SHALL detect errors/malfunctions including, but not limited to, paper jams/misfeeds, memory errors, or lack of consumables such as paper, ink, or toner, that may prevent paper records from being correctly printed.

**TA784d-3:** The VVPAT voting machine SHALL detect errors/malfunctions including, but not limited to, paper jams/misfeeds, memory errors, or lack of consumables such as paper, ink, or toner, that may prevent paper records from being correctly stored.

**TA784ei-1:** IF a printer error/malfunction is detected, THEN the VVPAT voting system SHALL present a clear indication to the voter of the error/malfunction.

**TA784ei-2:** IF a printer error/malfunction is detected, THEN the VVPAT voting system SHALL present a clear indication to the election officials of the error/malfunction.

**TA784ei-3:** This indication SHALL indicate clearly whether the current voter’s vote has been EITHER cast, discarded, OR is waiting to be completed.

**TA784eii-1:** IF a printer error/malfunction is detected, THEN the VVPAT voting machine SHALL suspend voting operations until the problem is resolved.

**TA784eiii:** IF an unrecoverable error/malfunction is detected THEN the VVPAT voting machine SHALL allow the current voter’s electronic ballot image to be cancelled by election officials.

**TA784eiv:** IF a printer error/malfunction is detected, THEN the VVPAT voting system SHALL protect the privacy of the voter while the error is being resolved.

**TA784f-1:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF a printer error or malfunction is detected, THEN procedures for recovery from these errors SHALL NOT expose the contents of previously cast paper records.

**TA784gi-1:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF rolls are removed from the voting device THEN all paper records SHALL be contained inside the secure container.

**TA784gii-1:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF rolls are removed from the voting device THEN the container SHALL be capable of being tamper-sealed.

**TA784gii-2:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF rolls are removed from the voting device THEN The container SHALL be capable of being locked.

**TA784giii-1:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF rolls are removed from the voting device THEN the container SHALL be capable of being labeled with the device serial number.

**TA784giii-2:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF rolls are removed from the voting device THEN the container SHALL be capable of being labeled with the device precinct number.

**TA784giii-3:** IF the VVPAT voting machine is a paper-roll VVPAT AND IF rolls are removed from the voting device THEN the container SHALL be capable of being labeled with other identifying information needed to support audits and recounts.

**TA784h-1:** IF a continuous paper spool is used to store paper records, THEN the manufacturer SHALL provide a mechanism for an auditor to a) unspool the paper, AND b) view each paper record in its entirety, AND then c) respool the paper.

**TA784h-1-1:** During the above process the paper SHALL NOT be modified.

**TA784i-1:** The printer SHALL ONLY have the capability to communicate with the VVPAT voting machine to which it is connected.

**TA784j-1:** The printer SHALL ONLY have the capability of functioning as a printer.

**TA784j-2:** The printer SHALL NOT contain any other services besides printer services, including, but not limited to, providing copier functions, or providing fax functions.

**TA784j-3:** The printer SHALL NOT contain any network capability.

**TA784k-1:** IF a protective covering is intended to be transparent on voting equipment THEN it SHALL be maintainable via a predefined cleaning process.

**TA784k-1-1:** The covering SHALL be replaceable in the event the covering becomes damaged such that it obscures the paper record.

**TA784l-1:** The paper record SHALL be of sufficient durability, to remain unchanged for minimally 22 months, to be used for verifications, reconciliations, and recounts conducted manually or by automated processing.