

Appendix A: Electronic Instant Bingo Technical Standards

Electronic Instant Bingo Device Requirements

1.1 Introduction

1.1.1 General Statement

This chapter sets forth the technical requirements for the key attributes of electronic instant bingo systems, including all associated hardware and software. All devices and systems developed for electronic instant bingo games shall meet the applicable requirements within this chapter.

1.1.2 Off-The-Shelf Components

Unless otherwise directed by the attorney general, the requirements within this chapter do not apply to devices that solely utilize unaltered commercial off-the-shelf (COTS) components, such as PCs or tablets. For devices that utilize modified off-the-shelf (MOTS) components, sections of this chapter will apply only to the modifications made to the components unless otherwise directed by the attorney general.

1.2 Participant Safety

1.2.1 Physical Hazards and Environmental and Electrical Safety Testing

Electrical and mechanical parts and design principles of the electronic instant bingo device shall not subject a participant to any physical hazards. The independent test laboratory does not make any findings with regard to Electro-Magnetic Compatibility (EMC) or Radio Frequency Interference (RFI), as that is the responsibility of the manufacturer of the device, or those that purchase the device. Such EMC and RFI testing may be required under separate statute, regulation, law, or act and should be researched accordingly by those parties who manufacture or purchase said device. The independent test laboratory does not test for, is not liable for, nor makes any findings related to these matters. However, during the course of testing, the independent test laboratory may inspect for marks or symbols indicating that a device has undergone product safety or other compliance testing by some other party but that is outside the scope of the requirements defined by this technical standard.

1.3 Environmental Effects on Integrity

1.3.1 General Statement

This section is only applicable for a Participant Device which has locally stored critical memory and/or installed software which has the potential to influence the regulated operations of electronic instant bingo.

Appendix A: Electronic Instant Bingo Technical Standards

1.3.2 Device Integrity

The independent test laboratory shall perform certain tests to determine whether or not an electrostatic discharge (ESD) or a power surge impacts the integrity of the regulated operations of electronic instant bingo. ESD testing and power surge testing are intended to simulate techniques observed in the field that may be used in an attempt to disrupt the integrity of the regulated operations of electronic instant bingo.

1.3.3 ESD Effects

Protection against ESD requires that the Participant Device's conductive cabinet be earthed in such a way that static discharge energy shall not permanently damage or permanently impact the normal operation of the electronics or other components within the Participant Device. A device may exhibit temporary disruption when subjected to a significant external ESD with a severity level of 15kV air discharge. The device shall exhibit a capacity to recover and complete any interrupted operation without loss or corruption of any locally stored control information or critical data following any temporary disruption.

1.3.4 Power Surges

The Participant Device shall not be adversely affected, other than resets, by surges or dips of $\pm 20\%$ of the power supply voltage. It is acceptable for the device to reset provided no damage to the equipment or loss or corruption of locally stored data is experienced which cannot be automatically recovered from the Back-Office Platform. Alternatively, the Participant Device may be equipped with an Uninterruptible Power Supply (UPS) or battery backup that, when detecting power loss, allows the completion of the current transaction before ceasing operations.

1.4 Basic Hardware Requirements

1.4.1 Identification Information

The electronic instant bingo device shall be identifiable by a unique serial number, model number, manufacturer identification, and any other information required by the attorney general.

1.4.2 On/Off Switch

For electronic instant bingo devices which utilize a physical cabinet, an on/off switch that controls the electrical current supplied to the device shall be located in a secured area of the device. The on/off positions of the switch shall be clearly labeled.

1.4.3 Touch Screen Displays

Touch screen displays, if used by regulated operations of electronic instant bingo shall be accurate, and if required by their design, shall support a calibration method to maintain that accuracy; alternatively, the display hardware may support automatic self-calibration.

Appendix A: Electronic Instant Bingo Technical Standards

1.5 Custom and Modified Hardware

1.5.1 General Statement

This section only applies to custom and modified hardware components which have the potential to influence the regulated operations of electronic instant bingo.

1.5.2 Printed Circuit Board (PCB) Identification Requirements

Each PCB shall be clearly identifiable by an alphanumeric identification and, when applicable, a revision number. If track cuts, patch wires, or other circuit alterations are introduced to the PCB, then a new revision number shall be assigned.

1.5.3 Switches and Jumpers

If the electronic instant bingo device contains switches and/or jumpers, they shall be fully documented for evaluation by the independent test laboratory. Hardware switches, jumpers, and system configurations that may alter the Ohio-specific configuration settings, prize structure, game denomination, or payout percentages must meet the “Configuration Settings” requirements in Section 2.4.1 of these rules and must be housed within a secured compartment of the device. This includes top prize changes, selectable settings, or any other option that would affect payout percentage.

1.5.4 Device Wiring

The electronic instant bingo device shall be designed so that power and data cables into and out of the device can be routed so that they are not accessible to the public. Security related wires and cables that are routed into a secured compartment must be securely fastened within the interior of the device.

NOTE: The independent test laboratory will make no determination as to whether the device installation conforms to local electrical codes, or to any other electrical testing standards and practices.

1.5.5 Wired Communication Ports

Wired communication ports shall be clearly labeled and shall be securely housed within the electronic instant bingo device to prevent unauthorized access to the ports or their associated cable connectors. For handheld electronic instant bingo devices, external ports, if any, must be secured or disabled from unauthorized use.

1.5.6 Convenience Charging Mechanisms

An electronic instant bingo device may support the use of an externally accessible charging mechanism for participant convenience, such as a Universal Serial Bus (USB) charging port, or some other analogous technology (e.g., cables, inductive chargers, etc.). The mechanism may be used to provide external power or charging access for an electronic device such as a smartphone, tablet, etc. If so equipped, the charging mechanism shall:

- a) Be appropriately fused and/or electrically-protected;

Appendix A: Electronic Instant Bingo

Technical Standards

- b) Not impact the integrity of the regulated operations of electronic instant bingo; and
- c) Not allow any data transmission between the device and the charging mechanism.

The requirements within this section are applicable only to charging devices which are part of a regulated gaming device, and provided to the player for convenience charging of personal electronic devices while playing. These requirements do not apply to charging procedures or hardware used by operators for battery maintenance of portable devices used to conduct game play.”

1.5.7 Displays and Monitors

If a Participant Device is equipped with a display/monitor, the following rules apply:

- a) The display/monitor shall fit properly into the device and the surrounding bezel in a manner that eliminates gaps or voids, resists the entry of objects, and which does not physically obscure or cover any required game display information;
- b) The resolution of the configured display/monitor shall be compatible with one or more of the resolutions supported by the electronic instant bingo software in a manner that ensures the intended function of the display; and
- c) The resolution of the configured display/monitor shall not clip or fail to display any information critical to game play.

1.6 Doors and Security

1.6.1 General Statement

This section on doors and security is only applicable for a Participant Device which:

- a) Utilizes a physical cabinet to house internal logic components.
- b) Performs transactions using peripheral devices installed within the device; and/or
- c) Has locally stored critical memory and/or installed software which has the potential to influence the regulated operations of electronic instant bingo.

1.6.2 Physical Security

The electronic instant bingo device shall be robust enough to resist forced entry into any secured doors, areas, or compartments. In the event that extreme force is applied to the cabinet materials causing a potential breach in device security, evidence of tampering shall be conspicuous. “Secured areas” or “secured compartments” shall include the logic area(s), external doors such as the main door or belly door, currency compartment doors such as a stacker door, and/or other sensitive access areas of the device that can potentially impact electronic instant bingo integrity.

1.6.3 External Doors

The following requirements apply to electronic instant bingo devices which contain external doors into any secured areas or compartments:

Appendix A: Electronic Instant Bingo

Technical Standards

- a) External doors shall be manufactured of materials that are suitable for allowing only legitimate access to the inside of the device.
- b) External doors and their associated hinges shall be capable of withstanding determined and unauthorized efforts to gain access to the interior of the device and shall leave conspicuous evidence of tampering if such an attempt is made;
- c) The seal between the device and the external door shall be designed to resist the entry of objects. It shall not be possible to insert an object into the device that disables a door open sensor when the device's door is fully closed, without leaving conspicuous evidence of tampering; and
- d) All external doors shall be secure and locked.

1.6.4 Logic Area

Electronic instant bingo devices with locally stored critical memory and/or installed software which has the potential to influence the regulated operations of electronic instant bingo shall have a separate internal locked logic area which shall be keyed differently than the front door access lock.

There may be more than one (1) such logic area in a participant device. Electronic components that are required to be housed in one (1) or more logic areas shall include:

- a) A Central Processing Unit (CPU) or microprocessor(s);
- b) Any Program Storage Device (PSD) that contains software that may affect the regulated operations of electronic instant bingo, including, but not limited to, game accounting, systems communication, execution of game play, game results display, security, etc.;
- c) Any electronics associated with the control logic for door monitoring and/or access detection;
- d) Any components that handle critical control program signature computation or verification;
- e) Any components that manage encryption/decryption of critical data;
- f) Any communication controller electronics, and/or components housing the PSD responsible for communications; and
- g) Critical memory backup devices.

1.6.5 Door Monitoring

Any doors that provide access to secure areas of the electronic instant bingo device shall be monitored by door access detection software.

- a) The detection software shall register a door as being open when the door is moved from its fully closed and locked position.
- b) When any door that provides access to a secured area or secured compartment registers as open, the device shall cease operation and display an appropriate error message. This error condition shall be communicated to the electronic instant bingo system.
- c) Door open events which provide access to the device logic area must be monitored whether or not the device is powered on. Upon restart the device must be capable of logging the door access and must be capable of transmitting the event to the central system upon reconnection. When multiple power off logic door access events occur, it is acceptable to report and log a single access event upon restart.

Appendix A: Electronic Instant Bingo Technical Standards

1.7 Bill Validators and Stackers

1.7.1 Bill Validators

Bill validators shall be constructed in a manner that ensures proper handling of inputs and that protects against vandalism, abuse, or fraudulent activity. In addition, bill validators shall meet the following:

- a) A bill validator shall only accept United State paper currency or a valid voucher to initiate play.
- b) A bill validator shall be electronically-based and configured to ensure that it accurately detects the entry of valid bills and vouchers, and provides a method to enable the electronic instant bingo device software to interpret and act appropriately upon a valid or invalid input;
- c) Invalid bills or vouchers must be rejected and shall be returned to the participant;
 - i. Each valid bill or voucher shall register credit on the device as monetary value in local currency.
- d) Credit shall only be registered when:
 - i. The bill or voucher has passed the point where it is accepted and stacked; and
 - ii. The bill validator has sent the "irrevocably stacked" message to the device.
- e) Each bill validator shall be designed to prevent the use of cheating methods such as stringing, the insertion of foreign objects, and any other manipulation that may be deemed a cheating technique. Appropriate correlating error conditions shall be generated and the bill validator shall be disabled;
- f) A method for detection of counterfeit bills must be implemented. Counterfeit bills shall be rejected with a high degree of accuracy; and
- g) Acceptance of any bills or vouchers for credit shall only be possible when the electronic instant bingo device is enabled for play and, for redeeming vouchers, communicating with the Electronic Instant Bingo System. Other states, such as error conditions including door opens, shall cause the disabling of the bill validator.

1.7.2 Bill Validator Error Conditions

If a bill validator error condition as listed below is identified, the electronic instant bingo device shall disable the bill validator, and provide a suitable error message or flash lights with respect to the bill validator itself. This error condition shall be communicated to the electronic instant bingo system. Bill validator error conditions shall include:

- a) Stacker full; it is recommended that an explicit "stacker full" error message not be utilized since this may promote a security issue; rather, a message such as "Bill Validator Malfunction" or similar is suggested;
- b) Bill or voucher jams;
- c) Bill validator communication failure; and
- d) Stacker removed; the device shall cease play, provided power is supplied to the device.

1.7.3 Bill Validator Self-Test

The bill validator shall perform a self-test during each power up. In the event of a self-test failure, the bill validator shall automatically disable itself until the error state has been cleared.

1.7.4 Bill Validator Communications

All bill validators shall communicate to the electronic instant bingo device using a secure bi-directional

Appendix A: Electronic Instant Bingo Technical Standards

protocol.

1.7.5 Bill Validator Settings

It shall only be possible to conduct preventive maintenance, or perform the following changes or adjustments to bill validators in the field:

- a) The selection of desired acceptance for bills or vouchers and their limits;
- b) Changing of certified critical control program media or downloading of certified software;
- c) Adjustment of the bill validator for the tolerance level for accepting bills or notes of varying quality shall not be allowed external to the electronic instant bingo device. Adjustments of the tolerance level must only be allowed with adequate levels of security in place. This can be accomplished through lock and key, physical switch settings, or other methods approved by the attorney general;
- d) Maintenance, adjustment, and repair per approved factory procedures; and
- e) Options that set the direction or orientation of acceptance.

1.7.6 Bill Validator Location

If an Electronic Instant Bingo Device is equipped with a bill validator, it shall be located in a secure area of the device but not within the logic area. Only the bill or voucher insertion area shall be accessible to the participant.

1.7.7 Power Failures During Acceptance

If a power failure occurs during acceptance of a bill or voucher, the bill validator shall give proper credit or return the bill or voucher. There may be a small window of time where power may fail and credit may not be given due to the timing of validating the bill or voucher. However, in this case, the timing window shall be less than one (1) second.

1.7.8 Bill Validator Stacker

Each bill validator shall have a secure stacker and all accepted items shall be deposited into the secure stacker receptacle. The secure stacker and its receptacle must be attached to the electronic instant bingo device in such a manner so that they cannot be easily removed by physical force and shall meet the following rules:

- a) The bill validator device shall have the ability to detect a stacker full condition; and
- b) There shall be a separate keyed lock to access the stacker area. This keyed lock shall be separate from the main door. In addition, a separate keyed lock shall be required to remove the bills from the stacker.

1.8 Payment and Payment Devices

1.8.1 Payments by the Electronic Instant Bingo Device

Available credit may be collected from the electronic instant bingo device by the participant pressing a collect or cash out button at any time other than during:

Appendix A: Electronic Instant Bingo

Technical Standards

- a) A game being played (subject to the applicable rules of the game);
- b) Any door open condition;
- c) Test/diagnostic mode;
- d) A credit meter or win meter increment, unless the entire amount is placed on the meters when the collect button is pressed; or
- e) An error condition, provided the error condition prevents a valid cash out which is not supported through some other means.

1.8.2 Collect Meter

There shall be a collect meter which will show the number of credits collected by the participant upon a cash out. This meter may include handpays. The collect meter must adhere to the following requirements:

- a) The collect meter shall be displayed to the participant upon a cash out event unless a tilt condition or malfunction exists, or unless the participant opts to view an informational screen such as a menu or help screen item; and
- b) The number of credits collected shall be subtracted from the participant's credit meter and added to the collect meter.

1.8.3 Cashout Limit Exceeded

If credits are collected, and the total credit value is greater than or equal to a specific limit as configured by the software, the electronic instant bingo device shall lock up until the credits have been paid, and the handpay or attendant-paid cancelled credit condition is cleared by the attendant or via a system-based command.

1.8.4 Voucher Issuance

An electronic instant bingo device may not directly dispense coins, cash, tokens, or anything else of value other than a credit voucher which contains at a minimum, the following information as applicable:

- a) Name of the organization and site name;
- b) Serial number of the electronic instant bingo device;
- c) The date (including day, month, and year) and time of voucher issuance;
- d) Numeric value of amount cashed out by the participant in dollars and cents;
- e) Unique voucher validation number or other identifier.
- f) For a printed voucher, it is permissible for the following information to be contained on the ticket stock itself, if not printed on the voucher:
 - i. Venue Name/Site Identifier;
 - ii. Indication that the voucher is only valid and must be redeemed within one hour of the end of the bingo session during which it was printed
 - i. Indication if the voucher is a "duplicate", assuming duplicate vouchers may be printed;

Appendix A: Electronic Instant Bingo Technical Standards

1.8.5 Printer Location

If an electronic instant bingo device is equipped with a printer, it shall be located within a secure area of the device, but not be housed within the logic area or the drop box.

1.8.6 Printer Error Conditions

If a printer error condition as listed below is identified, the electronic instant bingo device shall disable the printer, and provide a suitable error message or flash lights with respect to the printer itself. This error condition shall be communicated to the electronic instant bingo system. It is permissible for the electronic instant bingo device to detect these error conditions when the device tries to print. Once a printer error condition has been cleared, any unprinted voucher shall be generated or a suitable handpay shall be processed. Printer error conditions shall include:

- a) Out of paper/paper low;
- b) Printer jam/failure; and
- c) Printer disconnected.

Appendix A: Electronic Instant Bingo Technical Standards

Electronic Instant Bingo Software Requirements

2.1 Introduction

2.1.1 General Statement

This chapter sets forth the requirements for Electronic Instant Bingo Software. Electronic Instant Bingo Software refers to the software used to take part in regulated operations of electronic instant bingo which is downloaded to the electronic instant bingo device and run from the electronic instant bingo system, or a combination of the two.

2.2 Software Requirements

2.2.1 Software Identification

Electronic Instant Bingo Software shall contain sufficient information to identify the software revision level. If a software version is modified in any way, the manufacturer must assign a new version or code build number to the software.

2.2.2 Software Validation

The electronic instant bingo device and/or electronic instant bingo system shall have the ability to authenticate that all regulated critical components contained within any Electronic Instant Bingo Software are valid each time the software is loaded for use and on demand. Critical components may include but are not limited to elements that control communications, peripheral device firmware, or other components that affect the regulated operations of electronic instant bingo.

- a) The authentication shall employ a hash algorithm which produces a message digest of at least 128 bits.
- b) In the event of a failed authentication (i.e., program mismatch or authentication failure), the Electronic Instant Bingo Software shall cease operation and display an appropriate error message. This error condition shall be communicated to the electronic instant bingo system.

NOTE: Program verification mechanisms will be evaluated on a case-by-case basis and approved by the attorney general and the independent test laboratory based on industry-standard security practices.

2.2.3 Independent Software Verification

It shall be possible to perform an independent integrity check of the Electronic Instant Bingo Software from an outside source. This verification is required for all control programs that affect the integrity of the regulated operations of electronic instant bingo. The verification shall be accomplished by being authenticated by a third-party application run from the electronic instant bingo device and/or the

Appendix A: Electronic Instant Bingo Technical Standards

electronic instant bingo system, by allowing a third-party device to authenticate the media, or by allowing for removal of the media such that it can be verified externally. The independent test laboratory, prior to software approval, shall evaluate the integrity check method.

2.3 Critical Non-Volatile (NV) Memory

2.3.1 General Statement

This section on critical non-volatile (NV) memory is only applicable for a Participant Device which:

- a) Performs transactions using peripheral devices installed within the device; and/or
- b) Has locally stored critical memory and/or installed software which has the potential to influence the regulated operations of electronic instant bingo.

2.3.2 Contents of Critical NV Memory

Critical Non-Volatile (NV) memory shall be used to store all data elements that are considered vital to the continued operation of the Electronic Instant Bingo Software. Critical NV memory may be maintained by the Electronic Instant Bingo Device and/or the Electronic Instant Bingo System. These data elements include, but are not limited to:

- a) All electronic meters and logs defined in the “[Electronic Meters and Logs](#)” section of this standard;
- b) Current participant balance (as applicable);
- c) Game history/recall data;
- d) Game configuration data (e.g., payable, denomination, etc.) and state of operations (e.g., current game play status, progress, etc.); and
- e) Device configuration data (e.g., communications, etc.) and state of operations (e.g., error conditions, etc.).

2.3.3 Critical Memory Backup

Electronic Instant Bingo Devices whose operation relies on locally stored critical memory shall have a backup or archive capability, which allows the recovery of critical memory should a failure occur.

2.3.4 Critical Memory Errors

Critical memory storage shall be maintained by a methodology that enables errors to be identified. This methodology may involve signatures, checksums, redundant copies, database error checks, and/or other method(s) approved by the attorney general.

2.3.5 Critical Memory Checks

Comprehensive checks of critical memory data elements shall be made upon power up and program resumption. Critical memory that is not critical to electronic instant bingo integrity is not required to be checked.

Appendix A: Electronic Instant Bingo

Technical Standards

2.3.6 Unrecoverable Corruption of Critical Memory

An unrecoverable corruption of critical memory shall result in an error. Upon detection, the Electronic Instant Bingo Software shall cease operation and display an appropriate error message. Additionally, the critical memory error shall cause any communication external to the Participant Device to cease.

NOTE: This section is not intended to preclude the use of alternate storage media types, such as hard disk drives, for the retention of critical data. Such alternate storage media is still expected to maintain critical data integrity in a manner consistent with the requirements in this section, as applicable to the specific storage technology implemented.

2.3.7 Function of Critical Memory Reset

Following the initiation of a critical memory reset procedure utilizing a certified NV memory clear method, the critical control program shall execute a routine which initializes critical NV memory to the default state.

- a) All memory locations as per the critical memory clear process shall be fully reset in all cases.
- b) The default game display immediately following a critical memory reset shall not correspond to the highest advertised award. This applies to the primary game only and not to any secondary bonus features.

2.4 Configurations and Communications

2.4.1 Configuration Settings

Changes to any configuration settings for the regulated operations of electronic instant bingo may only be performed by a secure means.

- a) It shall not be possible to change a configuration setting that causes any obstruction or alteration to the electronic accounting meters without performing a critical memory clear. However, for games that keep the previous payable's data in memory, a critical memory clear is not required; and
- b) No changes to the set of games, or to the payable(s) offered to the participant for selection, are permitted while there are credits on the participant's credit meter, or while a game is in progress. However, specific protocol features are permitted which allow such changes to be made in a controlled fashion, as defined by the protocol.-

2.4.2 Integrity of Protocol Communications

The Electronic Instant Bingo Software shall accurately function as indicated by the communications protocol that is implemented, and as required by the attorney general. In addition, the following rules shall be met:

- a) The Electronic Instant Bingo Software shall be designed or programmed such that it may only communicate with authorized system components through secure communication protocols.
- b) After a program interruption, any communications to an external device shall not begin until the program resumption routine, including any self-test, is completed successfully.
- c) If communication between the electronic instant bingo device and an electronic instant bingo system is lost, the electronic instant bingo software shall cease operations related to that

Appendix A: Electronic Instant Bingo

Technical Standards

communication and display an appropriate error message. It is permissible for the Electronic Instant Bingo Software to detect this error when the device tries to communicate with the Electronic Instant Bingo System.

2.4.3 Protection of Sensitive Information

The Electronic Instant Bingo Software shall not allow any information contained in communication among the components of the electronic instant bingo system that is intended by the communication protocol to be protected, or which is of a sensitive nature, to be viewable through any display mechanism supported by the electronic instant bingo device. This includes, but is not limited to, validation numbers, secure PINs, participant data, or secure seeds and keys.

2.4.4 Software Communication

Any component of the electronic instant bingo system which is capable of bidirectional communication with internal or external associated equipment, or other equipment, shall utilize a robust communication protocol which ensures that erroneous data or signals do not adversely affect the integrity or operation of electronic instant bingo.

2.5 Electronic Meters and Logs

2.5.1 Information Access

The electronic meters and logs shall only be accessible by an authorized person and shall have the ability to be displayed on demand using a secure means. An electronic instant bingo device must not be capable of displaying any game information relating to the number of unsold instant bingo tickets or the number and value of prizes remaining in a game.

2.5.2 Electronic Accounting Meters

Electronic accounting meters shall be at least ten (10) digits in length. These meters shall be maintained in credit units equal to the denomination in local currency (in dollars and cents format). At a minimum, eight (8) digits must be used for the dollar amount and two (2) digits used for the cents amount. Electronic Instant Bingo Software configured for multi-denomination play shall display the units in local currency. Meters shall be labeled so they can be clearly understood in accordance with their function. The required electronic accounting meters are as follows:

- a) **Total Played.** The Electronic Instant Bingo Software must have a meter that accumulates the total value of all wagers, whether the wagered amount results from the insertion of currency, a voucher, a deduction from a credit meter or any other means;
- b) **Total Won.** The Electronic Instant Bingo Software must have a meter that accumulates the total value of all winnings, including the credits that are accumulated on the device;
- c) **Cancelled Credits.** The Electronic Instant Bingo Software must have a meter that accumulates the total value paid by an attendant or by system-based command and which results from a participant initiated cash-out that exceeds the configured capability of the Participant Device to make the proper payout amount;
- d) **Bill In.** The Electronic Instant Bingo Software shall have a meter that accumulates the total value of currency accepted by the electronic instant bingo device;

Appendix A: Electronic Instant Bingo Technical Standards

- e) Voucher In. The Electronic Instant Bingo Software shall have a meter that accumulates the total value of all vouchers accepted by the device;
- f) Voucher Out. The Electronic Instant Bingo Software shall have a meter that accumulates the total value of all vouchers issued by the device;
- g) Other Meters. Electronic Instant Bingo Software that allows for transactions related to regulated operations of electronic instant bingo that would not otherwise be metered under any of the above electronic accounting meters, shall maintain sufficient meters to properly reconcile all such transactions.

NOTE: Any accounting meter that is not supported by the functionality of the electronic instant bingo, is not required to be implemented by the supplier.

2.5.3 Electronic Occurrence Meters

Occurrence meters shall be at least eight (8) digits in length however, are not required to automatically roll over. Meters shall be labeled so they can be clearly understood in accordance with their function. The required electronic occurrence meters are as follows. In the event that the associated functions of the below meters are not supported (e.g., if a device does not contain a physical cabinet or external doors), then the associated meters are not required on the electronic instant bingo device:

- a) Games Played. The Electronic Instant Bingo Software must have meters that accumulate the number of games played:
 - i. Since power reset;
 - ii. Since game initialization (critical memory clear);
- b) External Doors. The Electronic Instant Bingo Software shall have meters that accumulate the number of times any external door (e.g., main or belly door, stacker door, currency area with an external door, etc.) has been opened;
- c) Stacker Door. The Electronic Instant Bingo Software shall have a meter that accumulates the number of times the stacker door has been opened;
- d) Bill Denomination In. The Electronic Instant Bingo Software shall have a specific occurrence meter for each denomination of currency accepted by the electronic instant bingo device; and
- e) Vouchers Accepted. The Electronic Instant Bingo Software shall have a specific occurrence meter that records the number of all vouchers accepted by the electronic instant bingo device.

NOTE: Any occurrence meter that is not supported by the functionality of electronic instant bingo, is not required to be implemented by the supplier.

2.5.4 Transaction Log

There shall be the capacity to display at minimum a complete transaction log for the previous twenty-five (25) transactions that incremented any of the meters related to bills, vouchers. The following information shall be displayed:

- a) The transaction value in local monetary units in numerical form;
- b) The time of day of the transaction, in twenty-four (24) hour format showing hours and minutes;
- c) The date of the transaction, in any recognized format, indicating the day, month, and year;
- d) For voucher transactions, the validation number with the following conditions:

Appendix A: Electronic Instant Bingo Technical Standards

- i. Where the log can be displayed from the electronic instant bingo device, only the last four (4) digits may be displayed for voucher-out transactions where the vouchers are yet to be redeemed;
- ii. Where the log can be displayed from the electronic instant bingo system, at least the last four (4) digits shall be displayed for voucher-in transactions;

2.5.5 Significant Event Log

At a minimum, the last one hundred (100) significant events for electronic instant bingo devices shall be stored with an appropriate timestamp in one or more secure logs that are not accessible to the participant and which minimally include the following events, as applicable:

- a) Software verification errors or critical memory errors, if technically possible to log these events based on the nature and/or severity of the error;
- b) Changes made to device configurations;
- c) Device communication failure;
- d) Power resets;
- e) Handpay conditions;
- f) Access to secured areas or secured compartments; and
- g) Peripheral errors, if supported.

2.6 Handheld Electronic Instant Bingo Devices

2.6.1 General Statement

In addition to the other requirements of this chapter (unless the application is clearly indicates otherwise, i.e. cabinet doors), hand held electronic instant bingo devices shall comply with the additional standards in this section.

2.6.2. Device Approval

A participant may only purchase electronic instant bingo tickets on a Handheld electronic instant bingo device by using funds preloaded onto the device by a means approved by the attorney general.

2.6.3 Client-Server Interactions

Handheld electronic instant bingo devices must not be capable of performing additional functions outside of the play of Electronic Instant Bingo.

- a) The software shall not access any ports (either automatically or by prompting the user to manually access) which are not necessary for the communication between the device and the system; and
- b) The software shall not possess the ability to override the volume settings of the device;

2.6.4 Compatibility Verification

During any installation or initialization and prior to commencing electronic instant bingo operations, the Electronic Instant Bingo Software used in conjunction with the Electronic Instant Bingo System shall

Appendix A: Electronic Instant Bingo Technical Standards

detect any incompatibilities or resource limitations with the Handheld electronic instant bingo device that would prevent proper operation of the software (e.g., software version, minimum specifications not met, browser type, browser version, plug-in version, etc.). If any incompatibilities or resource limitations are detected, the software shall prevent electronic instant bingo operations and display an appropriate error message.

2.6.5 Software Content

Electronic Instant Bingo Software shall not contain any malicious code or functionality deemed to be malicious in nature by the attorney general. This includes, but is not limited to, unauthorized file extraction/transfers, unauthorized device modifications, unauthorized access to any locally stored personal information (e.g., contacts, calendar, etc.) and malware.

Appendix A: Electronic Instant Bingo Technical Standards

Game Requirements

3.1 Introduction

3.1.1 General Statement

This chapter sets forth technical requirements for the participant interface, rules of play, game fairness, game selection, game outcome, related participant displays and artwork, payout percentages, bonus games, game history recall, game modes, common features, and other electronic instant bingo game requirements.

3.2 Participant Interface

3.2.1 General Statement

The participant interface is defined as an interface application or program through which the user views and/or interacts with the Electronic Instant Bingo Software, including the touch screen(s), button panel(s), or other forms of participant interaction devices.

3.2.2 Participant Interface Requirements

The participant interface shall meet the following requirements:

- a) Any resizing or overlay of the participant interface screen shall be mapped accurately to reflect the revised display and touch/click points.
- b) All participant-selectable touch/click points or buttons represented on the participant interface that impact game play and/or the integrity or outcome of the game shall be clearly labeled according to their function and shall operate in accordance with applicable game rules.
- c) There shall be no hidden or undocumented touch/click points or buttons anywhere on the participant interface that affect game play and/or that impact the integrity or outcome of the game, except as provided for by the game rules.
- d) The display of the instructions and information shall be adapted to the participant interface. For example, where a device uses technologies with a smaller display screen, it is permissible to present an abridged version of the game information accessible directly from within the game screen and make available the full/complete version of the game information via another method, such as a secondary screen, help screen, or other interface that is easily identified on the visual game screen.
- e) Where multiple items of instruction and information are displayed on the participant interface, it is acceptable to have this information displayed in an alternating fashion provided that, the rate at which information alternates permits a participant a reasonable opportunity to read each item.

3.2.3 Simultaneous Inputs

Simultaneous or sequential activation of various inputs of the electronic instant bingo device shall not cause game malfunctions and shall not lead to results that are contrary to a game's design intent.

Appendix A: Electronic Instant Bingo Technical Standards

3.3 Gaming Session Requirements

3.3.1 General Statement

A gaming session is defined as the period of time commencing, at minimum, when a participant initiates an electronic instant bingo game or series of games on an electronic instant bingo device for a particular game theme by committing a wager and ending at the time of a final game outcome for that game or series of games and coincident with the opportunity for the participant to exit the game.

3.3.2 Selection of Game

The following requirements apply to the selection of a specific electronic instant bingo game on the participant interface:

- a) The electronic instant bingo device shall clearly inform the participant of all games and denominations available for play.
- b) The participant shall be made aware of which game theme and denomination has been selected for play and is being played.
- c) The participant shall not be forced to play a game just by selecting a game theme, unless the game screen clearly indicates the game selection is unchangeable. If not disclosed, the participant shall be able to return to the main menu or game chooser screen prior to committing a wager.
- d) The default game display upon entering game play mode from a main menu or game chooser screen, shall not correspond to the highest advertised award (unless that was the outcome of the participant's last game play). This applies to the primary game only and not to any secondary bonuses/features.

3.3.3 Game Play Requirements

The following requirements apply to game play within a gaming session:

- a) A game cycle consists of all participant actions and game play activity that occur from wager to wager. Game cycle initiation shall occur after the participant:
 - i. Places a wager or commits a bet; and/or
 - ii. Presses a "play" button or performs a similar action to initiate a game (purchase an electronic instant bingo ticket) in accordance with the rules of the game.
- b) Amounts wagered or committed at any point at the start of a game cycle shall be subtracted from the participant's credit meter. A wager shall not be accepted that could cause the participant to have a negative credit meter balance.
- c) Each electronic instant bingo ticket must be initially displayed so that the numbers, letters, or symbols on the ticket are concealed at the initiation of play.
- d) Each electronic instant bingo ticket must require the participant to press a "play", "purchase", "open" or equivalent button to initiate the play of a ticket.
- e) An electronic instant bingo device may allow the participant to open each individual element (line, row, column, etc.) of each electronic instant bingo ticket, and/or the device may allow the player to choose to "open all". Electronic instant bingo devices are required to support both display methods.

Appendix A: Electronic Instant Bingo

Technical Standards

- f) The following game elements shall be considered to be part of a single game cycle:
 - i. Games that trigger a secondary bonus/feature or extended play games;
 - ii. "Second screen" bonuses/features;
 - iii. Features with participant choice;
- g) A participant wins a prize if the participant's electronic instant bingo ticket contains a combination of numbers or symbols that was designated in advance as a winning combination;
- h) A game cycle shall be considered complete when all funds wagered are lost or when the final transfer to the participant's credit meter takes place. The value of every award at the end of a game cycle is added to the participant's credit meter, except for handpays.
- i) If the award(s) from a single game cycle is in excess of any jurisdictional limit, including a taxation limit, that is defined/configured in the Electronic Instant Bingo Software, the game shall cease play, display an appropriate message, and require attendant intervention to resolve participant payment. It is permissible to provide a mechanism to accrue taxable winnings to a separate meter, however, this meter must not support any direct wagers. When the amount on the meter is collected by the participant, the game must still lock up as per the defined/configured limit required by the jurisdiction.
- j) It shall not be possible to start a new game within the same gaming session before the current game cycle is completed and the funds available for wagering and the game history have been updated, including the game elements listed above, unless the action to start a new game terminates the current game in an orderly manner.
- k) Electronic Instant Bingo Participant Devices which contain multiple game themes and denominations may only allow for a wagering on a single game at a time. Multiple simultaneous wagers may not be played

3.3.4 Information to be Displayed

A participant interface shall display the following information within a gaming session, with the exception of when the participant is viewing an informational screen such as a menu or help screen:

- a) Current funds available for wagering;
- b) Denomination being played;
- c) Current wager amount and placement of all active wagers, or sufficient display information to otherwise derive these parameters;
- d) Any participant wager options that occur prior to game initiation,
- e) For the last completed game, the following information until the next game starts, wager options are modified, or the participant exits the game;
 - i. Accurate representation of the game outcome;
 - ii. Amount won; and
 - iii. Any participant wager options in effect.

3.3.5 Seal Display Requirements

A participant interface shall display the official Ohio attorney general electronic instant bingo graphical seal on the video display of the device, as provided by the attorney general. The displayed seal must:

- a) Be of a resolution and on-screen location suitable for clear identification by participants.
- b) Include the Ohio license number of the game software manufacturer.
- c) Be visible at a minimum, each time a participant begins a new session.

Appendix A: Electronic Instant Bingo

Technical Standards

- d) For devices which support multiple game themes the AGO seal must be displayed at a minimum, each time a game theme is selected for play.
- e) Devices which have been disabled for play or are in an error condition are not required to display the AGO seal.

3.3.6 Credit Meter

With the exception of when the participant is viewing an informational screen such as a menu or help screen item, the credit meter shall be displayed to the participant unless a tilt condition or malfunction exists that impacts its proper display. Additionally, the credit meter shall conform to the following requirements:

- a) The credit meter shall be visible to the participant at any time a wager may be placed, at any time credit acceptance or credit redemption is allowed, or at any time the meter is actively being incremented or decremented.
- b) The credit meter shall be displayed in local currency format (dollars and cents) only.

3.3.7 Requirements for Game Interruption and Resumption

After a program interruption, the Electronic Instant Bingo Software shall recover to the state it was in immediately prior to the interruption occurring. Where no participant input is required to complete the game, it is acceptable for the game to return to a game completion state, provided the game history and all credit and accounting meters reflect a completed game.

3.4 Game Information and Rules of Play

3.4.1 Game Information and Rules of Play

The following requirements apply to the game information, artwork, paytables, and help screens including any written, graphical, and auditory information provided to the participant by the electronic instant bingo device:

- a) Participant interface and participant interaction device usage instructions, payable information, and rules of play shall be complete and unambiguous and shall not be misleading or unfair to the participant.
- b) Help screen information shall be accessible by a participant without the need for funds deposited or commitment of a wager. This information shall include descriptions of unique game bonuses/features, extended play, free games, autoplay, countdown timers, symbol transformations, or other game features.
- c) Minimum, maximum, and other available wagers shall be stated within, or be able to be deduced from, the artwork, with adequate instruction for any available wager option.
- d) Paytable information shall include all possible winning outcomes and combinations, along with their corresponding payouts, for any available modifiers and/or wager options.
- e) The artwork shall clearly indicate that awards are designated in currency.
- f) For artwork that contains game instructions explicitly advertising a monetary award or merchandise prize, it shall be possible to win the advertised award/prize from a single game, or series of games enabled by an initiating game, when including bonuses/features, or other game

Appendix A: Electronic Instant Bingo

Technical Standards

- options, or the artwork shall clearly specify the criteria necessary to win the advertised award/prize.
- g) The game shall reflect any change in award value, which may occur during the course of play. This may be accomplished with a digital display in a conspicuous location of the participant interface. The game shall clearly state the criteria for which any award value is modified.
 - h) Game instructions that are presented aurally shall also be presented in written form within the artwork.
 - i) Game instructions shall be rendered in a color that contrasts with the background color to ensure that all instructions are clearly visible/readable.
 - j) The artwork shall clearly state the rules for payments of awards. If a specific winning combination is paid where multiple wins are possible, then the payment method shall be described.
 - i. The artwork shall clearly communicate the treatment of coinciding game outcomes. Where a payline may be interpreted to have more than one such winning combination, there shall be a statement if only the highest winning combination is paid per line.
 - ii. Where the same symbol can qualify for a line pay and scatter pay simultaneously or where line and scatter pays occur simultaneously on the same line, the artwork shall indicate if the participant will be paid for both wins, or the greater of the two.
 - iii. The artwork shall clearly communicate the treatment of coinciding scattered wins with respect to other possible scattered wins. For example, the artwork shall state whether combinations of scattered symbols pay all possible awards or only the highest award.
 - k) Where multiplier instructions are displayed in artwork, it shall be clear what the multiplier does and does not apply to.
 - l) All game symbols/objects shall be clearly displayed to the participant and shall not be misleading.
 - i. Game instructions that specifically correspond to one or more symbols/awards, shall be clearly associated with those symbols/awards. For example, this may be achieved with appropriate framing or boxing. Additional wording such as “these symbols” may also be used.
 - ii. If game instructions refer to a particular symbol, and the written name for the symbol may be mistaken for another symbol, or may imply other characteristics, then the visual display of the instructions shall clearly indicate to which symbol the instruction refers.
 - iii. Game symbols and objects shall retain their shape throughout all artwork, except while animation is in progress. Any symbol that changes shape or color during an animation process shall not appear in a way that can be misinterpreted to be some other symbol defined in the paytable.
 - iv. If the function of a symbol changes (e.g., a non-substitute symbol becomes a substitute symbol during a feature), or the symbol’s appearance changes, the artwork shall clearly indicate this change of function or appearance and any special conditions that apply to it.
 - v. If limitations exist with respect to the location and/or appearance of any symbol, the limitation shall be disclosed in the artwork. For example, if a symbol is only available in a bonus game, or on a specific deal, then the artwork shall disclose this.
 - m) The artwork shall clearly state which symbols/objects may act as a substitute or wild, and in which winning combinations the substitute or wild may be applied; this description shall address any/all phases of game play where a wild or substitute symbol operates.
 - n) The artwork shall clearly state which symbols/objects may act as a scatter and in which winning combinations the scatter may be applied.
 - o) The artwork shall contain textual and/or graphical information to clearly explain the order in which symbols are to appear, in order for an award to be issued or a feature to be triggered, including numbers to indicate how many correct symbols/objects each pattern corresponds to.
 - p) The game shall not advertise ‘upcoming wins’, for example, “three times pay coming soon”, unless

Appendix A: Electronic Instant Bingo

Technical Standards

the advertisement is accurate and mathematically demonstrable, or unless the participant has a direct advertisement of the current progress to that win (e.g., they have two of four tokens collected that are required to win an award).

- q) The artwork shall disclose any restrictive features of game play, such as any play duration limits, maximum win values, etc. which are implemented as an element of game design.

3.4.2 Game Flares

A participant device interface shall provide for display of a game flare for each available deal of electronic instant bingo tickets which contains, at a minimum:

- a) Name of game;
- b) Manufacturer's form number for each deal displayed;
- c) Cost per play of each electronic instant bingo ticket;
- d) Value and number of winning prizes within the deal;
 - i. The number of prizes available may be designated by a number or by a quantity of symbols that represent the number of winning prizes and the winning number or symbol.
 - ii. Award symbols must be pictured on a flare, not described.
- e) Total number of electronic instant bingo tickets within the deal.

3.4.3 Bonus or Extended Play Features

If a bonus or extended play feature is used for electronic instant bingo games, a notification must be provided to the participant explaining that such a feature is used on the game, and that these additional bonus or extended play features do not award prizes in addition to the predetermined prize for that electronic instant bingo ticket.

3.4.4 Game Theme Restrictions

A participant device must be used to play only electronic instant bingo tickets. No other game type may be played on the device and no level of player skill may be involved in the determination of any electronic instant bingo prize. An electronic instant bingo game may incorporate an entertainment or bonus graphical display theme, provided that any game, entertainment, or bonus theme does not:

- a) Require additional consideration or award any prize other than any predetermined prize associated with the electronic instant bingo ticket.
- b) Replicate or simulate any of the following:
 - i. Horse racing;
 - ii. Keno, blackjack, roulette, poker, craps, and any other casino-style table games;
 - iii. Spinning reels that resemble a slot machine;
- c) Involve rotating reels marked into horizontal segments by varying symbols, where the predetermined prize amount depends on how and how many of the symbols line up when the rotating reels come to a rest.

Appendix A: Electronic Instant Bingo Technical Standards

3.5 Randomization

3.5.1 General Statement

The Electronic Instant Bingo System shall utilize randomization only in the creation of the deals for electronic instant bingo tickets. All generation and randomization of game deals must take place at the system's central server prior to distribution to electronic instant bingo devices. Once created and randomized, all deals must be used in the order generated.

3.5.2 Game Selection Process

Determination of electronic instant bingo tickets shall not be influenced, affected, or controlled by anything other than the values selected by an Electronic Instant Bingo System's approved randomization process, in accordance with the following requirements:

- a) The game shall not limit the electronic instant bingo tickets available for selection.
- b) The game shall not modify or discard previously randomized electronic instant bingo tickets due to adaptive behavior. Additionally, electronic instant bingo tickets shall be used as directed by the rules of the game;
- c) After selection of the electronic instant bingo ticket, the game shall not display a "near miss" where it makes a variable secondary decision which affects the result shown to the participant. For example, if the electronic instant bingo ticket is losing outcome, the game shall not substitute a different losing outcome to show to the participant than that originally selected.
 - i. Except as provided for by the rules of the game, electronic instant bingo tickets shall be independent and shall not correlate with any other previous electronic instant bingo tickets;
 - ii. An electronic instant bingo system shall not adapt its theoretical return to the participant based on past payouts;
- d) Any associated equipment used in conjunction with an electronic instant bingo system shall not influence or modify the behaviors of the game's randomization process, except as authorized, or intended by design; and
- e) Participant Devices shall not contain any logic utilized to generate the outcome of any electronic instant bingo ticket or that affects the order of electronic instant bingo tickets as dispensed from the Electronic Instant Bingo System. All critical functions including the generation of any electronic instant bingo ticket shall be generated by the Electronic Instant Bingo System and be independent of the electronic instant bingo device.

3.5.3 Game Fairness

The following requirements shall apply to the fairness of the game:

- a) Games shall not be designed as to give a participant the perception that they have control over the outcome of the game due to skill or dexterity, when they actually do not (i.e., the game outcome is random and the illusion of skill is for entertainment value only).
- b) Games shall not include any hidden source code that can be leveraged by a participant to circumvent the rules of play and/or the intended behaviors of game design; this requirement shall not preclude

Appendix A: Electronic Instant Bingo

Technical Standards

reasonably identifiable “discovery features” offered by a game which are intentional from a design perspective, but which may be undocumented or unknown to the participant; and

- c) The final outcome of each game shall be displayed for a sufficient length of time that permits a participant a reasonable opportunity to verify the outcome of the game; this requirement shall not preclude an option for the participant to bypass the outcome display.

3.6 Electronic Instant Bingo Ticket Deals

3.6.1 Deal Requirements

At the start of each game, no more than one electronic instant bingo deal may be transmitted to the Electronic Instant Bingo System for each game. Each deal shall meet the following minimum requirements:

- a) Each deal created for the same game must be identical in construct, which includes deal version, manufacturer, game name, total number of electronic instant bingo tickets, purchase price per ticket, and prize structure;
- b) Each deal has a predetermined, finite number of winning and losing tickets and a predetermined prize amount and deal structure, provided that there may be multiple winning combinations in each deal and multiple winning tickets;
- c) Each deal must be made up of a fixed number of electronic instant bingo tickets not to exceed a maximum of 25,000 tickets;
- d) Electronic instant bingo tickets shall not be commingled.
- e) Each electronic instant bingo ticket within a deal has a unique serial number that is not regenerated;
- f) Each electronic instant bingo ticket within a deal is sold for the same price;
- g) Each electronic instant bingo ticket shall have a specific outcome and prize level associated with it;
- h) Each deal in play must be completed or terminated prior to a new deal being placed into play.

3.6.2 Dispensing of Electronic Instant Bingo Tickets

Upon purchasing an electronic instant bingo ticket from an electronic instant bingo device, the Electronic Instant Bingo System shall dispense an electronic instant bingo ticket from an associated deal, which is then provided to the device for display and if a winning ticket, payment. Tickets shall be dispensed in the order they are stored following deal creation on the system’s central server. Once the participant receives the electronic instant bingo ticket, that ticket shall be “removed” from the deal and not be re-used within the same deal.

3.6.3 Completion of Deal

A deal is deemed to be completed only when all of the electronic instant bingo tickets in a deal have been dispensed or the deal has been taken out of play.

3.6.4 Termination of Deal

Once a deal is made available for play, that deal may not be manually paused or taken out of play, and then reinstated for play. If the deal is manually paused or taken out of play, termination of the entire

Appendix A: Electronic Instant Bingo

Technical Standards

deal shall immediately occur. Notwithstanding, a game may be paused and reinstated for play by a manufacturer only with prior notification to the attorney general. This notification must identify the game, current deals in play, and reason for pausing. Once paused, the game must either reinstate play or terminate the paused deal. New deals may not be placed into play while the game is paused.

3.7 Alternative Game Modes

3.7.1 Test/Diagnostic Mode

Test/diagnostic mode (sometimes called demonstration or audit mode) allows a manufacturer to view game play mechanics, perform payable tests, or execute other auditing and/or diagnostic functions supported by the Electronic Instant Bingo Software. If test/diagnostic mode is supported, the following rules shall apply:

- a) Entry to test/diagnostic mode shall only be possible using a secure means that is not accessible to the participant.
- b) If the Electronic Instant Bingo Software is in a test/diagnostic mode,
 - i. The Electronic Instant Bingo Software shall clearly indicate that it is in this mode; and
 - ii. Any test or diagnostic that incorporates funds entering or leaving the device shall be completed prior to the resumption of normal electronic instant bingo operation.
- c) Any credits on the device that were accrued during the test/diagnostic mode shall be automatically cleared when the mode is exited.
- d) When exiting from test/diagnostic mode, the game shall return to the original state it was in when the test/diagnostic mode was entered.

3.8 Game History Recall

3.8.1 Number of Last Games Required

Information on at least the last ten (10) games played on the electronic instant bingo device shall be retrievable using an external key-switch or other secure method that is not available to the participant. Such access may include retrieval of game history from the electronic instant bingo system.

3.8.2 Last Play Information Required

Game recall shall consist of graphical, textual, or video content, or some combination of these options, so long as the full and accurate reconstruction of game outcome is possible. Game recall shall display the following information:

- a) Date and time stamp;
- b) The denomination played for the game, if a multi-denomination game type;
- c) The display associated with the final outcome of the game, either graphically or via a clear text description;
- d) The credit meter value at the start of play and/or at the end of play;
- e) Paytable identification, unless discernible from other screens or menus;

Appendix A: Electronic Instant Bingo Technical Standards

- f) Total amount wagered;
- g) Total amount won;
- h) Total amount collected after the end of a game, unless discernible from other screens or menus;
- i) The results of any participant choices involved in the game outcome;
- j) The results of any intermediate game phases, such as bonus games; and
- k) If a progressive prize was won, an indication that the progressive was awarded.

Random Number Generator (RNG) Evaluation Requirements

4.1 Introduction

4.1.1 General Statement

This chapter sets forth the technical requirements for a Random Number Generator (RNG) used within the electronic instant bingo system for the purpose of generating shuffled deals of outcomes. See also related requirements found in the “Randomization” chapter of this standard.

4.2 General RNG Requirements

4.2.1 Source Code Review

The independent test laboratory shall review the source code pertaining to any and all core randomness algorithms, scaling algorithms, shuffling algorithms, and other algorithms or functions that play a critical role in the final random outcome selected for use by a game. This review shall include comparison to published references, where applicable, and an examination for sources of bias, errors in implementation, malicious code, code with the potential to corrupt behavior, or undisclosed switches or parameters having a possible influence on randomness and fair play.

4.2.2 Statistical Analysis

The independent test laboratory shall employ statistical tests to assess the outcomes produced by the RNG, after scaling, shuffling, or other mapping (hereafter referred to as “final outcome output”). The independent test laboratory shall choose appropriate tests on a case-by-case basis, depending on the RNG under review and its usage within the game. The tests shall be selected to assure conformance to intended distribution of values, statistical independence between draws, and, if applicable, statistical independence between multiple values within a single draw. The applied tests shall be evaluated, collectively, at a 99% confidence level. The amount of data tested shall be such that significant deviations from applicable RNG testing criteria can be detected with high frequency. In the case of an RNG intended for variable usage, it is the responsibility of the independent test laboratory to select and test a representative set of usages as test cases. Statistical tests may include any one or more of the following:

- a) Total Distribution or Chi-square test;

Appendix A: Electronic Instant Bingo

Technical Standards

- b) Overlaps test;
- c) Coupon Collector's test;
- d) Runs test;
- e) Interplay Correlation test;
- f) Serial Correlation test; and
- g) Duplicates test.

4.2.3 Distribution

Each possible RNG selection shall be equally likely to be chosen. Where the game design specifies a non-uniform distribution, the final outcome shall conform to the intended distribution.

- a) All scaling, mapping, and shuffling algorithms used shall be unbiased, as verified by source code review. The discard of RNG values is permissible in this context and may be necessary to eliminate bias; and
- b) The final outcome output shall be tested against intended distribution using appropriate statistical tests (e.g., Total Distribution test).

4.2.4 Independence

Knowledge of the numbers chosen in one selection shall not provide information on the numbers that may be chosen in a future selection. If the RNG selects multiple values within the context of a single selection, knowing one or more values shall not provide information on the other values within the selection, unless provided for by the game design.

- a) As verified by source code review, the RNG shall not discard or modify selections based on previous selections, except where intended by game design (e.g., without-replacement functionality); and
- b) The final outcome output shall be tested for independence between draws and, as applicable, independence within a draw, using appropriate statistical tests (e.g., Serial or Interplay Correlation tests, and Runs test).

4.2.5 Available Outcomes

As verified by source code review, the set of possible outcomes produced by the RNG solution (i.e., the RNG period), taken as a whole, shall be sufficiently large to ensure that all outcomes shall be available for each selection with the appropriate likelihood, independent of previously produced outcomes, except where specified by the game design.

4.2.6 Unpredictability

The state of the RNG must be modified between every shuffle unless a "cryptographic RNG" is implemented, as defined elsewhere within this chapter. If necessary to ensure unpredictability, such modification may be additionally required within a game. Note that hardware devices are considered to modify their state continuously. Possible modifications of RNG state that may satisfy this requirement include, but are not limited to:

Appendix A: Electronic Instant Bingo

Technical Standards

- a) The discard of an unpredictable number of RNG values (i.e., background cycling). If the number of discarded values is determined by an RNG, it may not be determined by the primary RNG itself, but must instead be determined by a secondary RNG, independent and asynchronous to the primary RNG; and
- b) The overwriting (re-seeding) or mixing (entropy injection) of all or a portion of the RNG state by an external event or entropy source. The re-seeding or mixing shall be done in such a way that does not compromise the intended distribution, independence, or availability of prizes. The external event or entropy source shall not be able to be predicted or estimated by a participant.

4.3 Software-Based RNG

4.3.1 General Statement

Software-based RNGs do not use hardware devices and derive their randomness principally and primarily from a computer-based or software-driven algorithm. They do not incorporate hardware randomness in a significant way. The following requirements apply to software-based RNGs if used by the Electronic Instant Bingo System.

4.3.2 Seeding

The initial state, or seed, of the RNG shall be randomly determined by an uncontrolled and unpredictable event. The manufacturer must ensure that games will not synchronize, even when powered-on or booted simultaneously. The set of available seeds shall be sufficiently large to ensure independence of outcomes.

4.4 Hardware-Based RNG

4.4.1 General Statement

Hardware-based RNGs derive their randomness from small-scale physical events such as electric circuit feedback, thermal noise, radioactive decay, photon spin, etc. The following requirements apply to hardware-based RNGs if used by the Electronic Instant Bingo System.

4.4.2 Dynamic Output Monitoring

Due to their physical nature, the performance of hardware-based RNGs may deteriorate over time or otherwise malfunction, independent of the electronic instant bingo system. The failure of a hardware-based RNG could have serious consequences for the intended usage of the RNG. For this reason, if a hardware-based RNG is used, there shall be dynamic monitoring of the output by statistical testing. This monitoring process shall disable game play when malfunction or degradation is detected.

4.5 Cryptographic RNG

Appendix A: Electronic Instant Bingo Technical Standards

4.5.1 General Statement

A cryptographic RNG is one that cannot be feasibly compromised by a skilled attacker with knowledge of the source code. The following RNG requirements apply to cryptographic RNGs if used by the Electronic Instant Bingo System:

4.5.2 RNG Attacks

At a minimum, cryptographic RNGs shall be resistant to the following types of attack, all of which serve to replace the general RNG requirements for 'unpredictability':

- a) **Direct Cryptanalytic Attack:** Given a sequence of past values produced by the RNG, it shall be computationally infeasible to predict or estimate future RNG values. This must be ensured through the appropriate use of a recognized cryptographic algorithm (RNG algorithm, hash, cipher, etc.);
- b) **Known Input Attack:** It shall be infeasible to computationally determine or reasonably estimate the state of the RNG after initial seeding. In particular, the RNG must not be seeded from a time value alone. The manufacturer must ensure that games will not have the same initial seed, even when powered-on or booted simultaneously. Seeding methods shall not compromise the cryptographic strength of the RNG; and
- c) **State Compromise Extension Attack:** The RNG shall periodically modify its state, through the use of external entropy, limiting the effective duration of any potential exploit by a successful attacker.

NOTE: Because of continuous computational improvements and advances in cryptographic research, compliance to this criterion shall be re-evaluated as required by the attorney general.

Appendix A: Electronic Instant Bingo Technical Standards

Electronic Instant Bingo System Requirements

5.1 Introduction

5.1.1 General Statement

The electronic instant bingo system is comprised of multiple computer systems at various sites, the system as a whole and all communication between its components shall conform to the applicable technical requirements within this document.

5.2 System Clock Requirements

5.2.1 System Clock

The Electronic Instant Bingo System shall maintain an internal clock that reflects the current date and time that shall be used to provide for the following:

- a) Time stamping of all transactions and games;
- b) Time stamping of significant events; and
- c) Reference clock for reporting.

5.2.2 Time Synchronization

The Electronic Instant Bingo System shall be equipped with a mechanism to ensure the time and dates between all connected devices and components that comprise the system are synchronized and set correctly.

5.3 Control Program Requirements

5.3.1 Control Program Self-Verification

The Electronic Instant Bingo System shall be capable of verifying that all critical control program components contained on the system are authentic copies of the approved components of the system, at least once every twenty-four hours and on demand using a method approved by the attorney general. The critical control program authentication mechanism shall:

- a) Employ a cryptographic hash algorithm which produces a message digest of at least 128 bits. Other test methodologies shall be reviewed on a case-by-case basis.
- b) Include all critical control program components which may affect electronic instant bingo operations, including but not limited to executables, libraries, gaming or system configurations, operating system files, components that control required system reporting, and database elements that affect system operations; and

Appendix A: Electronic Instant Bingo

Technical Standards

- c) Provide an indication of the authentication failure if any critical control program component is determined to be invalid.

5.3.2 Control Program Independent Verification

Each critical control program component of the Electronic Instant Bingo System shall have a method to be verified via an independent third-party verification procedure. The third-party verification process shall operate independently of any process or security software within the system. The independent test laboratory, prior to system approval, shall evaluate the integrity check method.

5.4 Gaming Management

5.4.1 Gaming Management

The Electronic Instant Bingo System shall be able to disable the following on demand:

- a) All electronic instant bingo activity;
- b) Individual game themes/paytables or deals; and
- c) Individual electronic instant bingo Devices.

5.4.2 Deal Auditing

The audit or other game determination with respect to electronic instant bingo tickets, including a determination of the individual prizes won or individual prizes remaining to be won within an active deal, shall not be accessed by or be able to be modified by anyone until after completion or termination of the deal. If an audit or other game determination must be conducted while a deal is in play, termination of the entire deal shall immediately occur.

5.4.3 Address Requirements

The electronic instant bingo device shall allow for the association of a unique identification number to be used in conjunction with an Electronic Instant Bingo System. This identification number will be used by the system to track all mandatory information of the associated device. Additionally, the system shall not allow for duplicate entries of this identification number.

5.4.4 System Communications

The communication between the electronic instant bingo device and the Electronic Instant Bingo System shall be through a secure mechanism, using a robust communication protocol that ensures that the wrong data or signals do not adversely affect the integrity or operation, and does not allow any external connection to directly access the internal components, software or data of the device. In addition, the interface element shall:

- a) Be based on a specific defined protocol or a specific set of defined commands and as a result of these commands, retrieve information for an external request;
- b) Place data in an area sufficiently segregated from the Electronic Instant Bingo Software that is available to external requests or associated equipment; or

Appendix A: Electronic Instant Bingo Technical Standards

- c) Be of a suitable design capable of supplying requested information while isolating the external request or equipment from the device internal components, software or data.

5.4.5 Significant Events and Metering

All electronic instant bingo systems must be equipped with a device, mechanism or method for retaining the value of all meter information specified within these requirements, on a per-device basis. These meter values must be transmitted to, stored by, and available via reports generated by the electronic instant bingo system, on demand. The following information shall be generated for each electronic instant bingo device and communicated to the Electronic Instant Bingo System for storage pursuant to section 5.4.4:

- a) Significant event information listed within the “Significant Event Log” section of this document must be communicated and recorded as applicable. Each event must be stored in a database, which includes the following:
 - i. The date and time which the event occurred.
 - ii. Identity of the electronic instant bingo device that generated the event.
 - iii. A unique number/code that defines the event; or
 - iv. A brief text that describes the event in the local language.
- b) Metering information listed within section 2.5.3 (“Electronic Accounting and Occurrence Meters”) must be communicated and recorded as applicable. Metering information on the Electronic Instant Bingo System must be:
 - i. Stored in a database in local currency; and
 - ii. Labeled so they can be clearly understood in accordance to their function.

5.4.6 Location Detection for Handheld Participant Devices

All electronic instant bingo ticket purchases using a Handheld electronic instant bingo device must be initiated and received or otherwise made by a participant located in the approved permitted boundary of the site.

- a) The Electronic Instant Bingo System shall incorporate a location detection service or application to reasonably detect and dynamically monitor the location of a participant attempting to purchase electronic instant bingo tickets; and to monitor and enable the blocking of unauthorized attempts to purchase electronic instant bingo tickets.
 - i. Each participant shall pass a location check prior to completing the first purchase after logging in on a specific device. Subsequent location rechecks on that device shall occur prior to completing purchases after a period of fifteen seconds since the previous location check or after detection of a change in IP Address.
 - ii. If the location check indicates the participant is outside the permitted boundary or cannot successfully locate the participant, the purchase shall be rejected, and the participant shall be notified of this.
 - iii. An entry shall be recorded in a time stamped log any time a location violation is detected, including the participant and the detected location.
- b) The Electronic Instant Bingo System or location detection service or application must:
 - i. Ensure coverage can be limited to the permitted boundary;
 - ii. Ensure any hardware devices used for location checks are on a maintenance schedule to perform

Appendix A: Electronic Instant Bingo Technical Standards

- hardware checks, replace batteries and adjust placement, if applicable;
 - iii. Remotely monitor unauthorized operation or tampering of any hardware devices used for location checks, such as unauthorized third-party usage, modification and damage; and
 - iv. Maintain a record keeping system of all location data, per location, accessible to the attorney general.
- c) When Beacon Technology is used, such as short-range communications hardware technology such as Bluetooth Beacons, Near-Field Communication, Ultra-Wideband and/or Ultrasonic Sound:
- i. The Beacon Technology shall include the ability to adjust broadcast signal strength to ensure broadcast remains within the permitted boundary as much as reasonably practicable and fine tune and set parameters of the signal strength/broadcast ranges to clearly define the permitted boundary.
 - ii. The Electronic Instant Bingo System or the location detection service or application shall refresh tokens broadcasted by the Beacon Technology at least every five minutes and invalidate old tokens broadcasted by the Beacon Technology to prevent attacks or hacking techniques using expired tokens.

NOTE: Alternative methodologies and technologies of location detection shall be reviewed and approved by the attorney general on a case by case basis.

5.5 Voucher Transactions

5.5.1 General Statement

The following section applies to the use of printed vouchers.

5.5.2 Payment by Voucher

Payment by voucher as a method of credit redemption is only permissible when the Validation Software for vouchers is in use. Validation Software for vouchers may be entirely integrated into the Electronic Instant Bingo System or exist as an entirely separate Validation System connected to the Electronic Instant Bingo System.

5.5.3 Voucher Redemption

The Validation Software must process voucher redemption correctly according to the secure communication protocol implemented.

- a) The Validation Software shall have the ability to identify and provide a notification in the case of invalid or unredeemable vouchers for the following conditions:
- i. Voucher cannot be found on file;
 - ii. Voucher has already been paid;
 - iii. Amount of voucher differs from amount on file (requirement can be met by display of winning wager amount for confirmation during the redemption process); or
 - iv. Voucher redemption is outside the permissible time period.

Appendix A: Electronic Instant Bingo Technical Standards

- b) The Validation Software shall update the voucher status on the database during each phase of the redemption process accordingly. In other words, whenever the voucher status changes, the software shall update the database. Upon each status change, the database must indicate the following information:
 - i. Date and time of status change;
 - ii. Status of voucher (i.e. valid, unredeemed, pending, void, invalid, redemption in progress, redeemed, etc.);
 - iii. Value of the voucher; and
 - iv. The electronic instant bingo device identifying number which issued the voucher.

5.6 Information to be Maintained

5.6.1 Data Retention and Time Stamping

The Electronic Instant Bingo System shall be capable of maintaining and backing up all recorded data as discussed within this section:

- a) The system clock shall be used for all time stamping.
- b) The system shall provide a mechanism to export the data for the purposes of data analysis and auditing/verification (e.g., CSV, XLS).

5.6.2 Deal Information

For each individual deal available for play, the information to be maintained and backed up by the Electronic Instant Bingo System shall include, as applicable:

- a) A unique identification number identifying each deal;
- b) A unique name or description of the deal sufficient to categorize the deal relative to other deals;
- c) The number of electronic instant bingo tickets in the deal;
- d) The ideal RTP of the deal;
- e) The payable for the deal;
- f) The number of electronic instant bingo tickets at each prize level;
- g) The price per electronic instant bingo ticket assigned to the deal;
- h) The time and date that the deal became available for play;
- i) For completed or terminated deals:
 - i. The number of electronic instant bingo tickets purchased at each level of the payable;
 - ii. The number of electronic instant bingo tickets unsold at each level of the payable;
 - iii. The time and date that the deal was completed or terminated; and
 - iv. The final payout percentage of the deal.

5.6.3 Significant Event Information

Significant event information to be maintained and backed up by the Electronic Instant Bingo System shall include, as applicable:

- a) Program error or authentication mismatch;
- b) Significant periods of unavailability of any critical component of the system (any length of time game

Appendix A: Electronic Instant Bingo

Technical Standards

play is halted for all participants, and/or transactions cannot be successfully completed for any user);

- c) Large wins, as defined by the attorney general, (single and aggregate over defined time period);
- d) Large wagers, as defined by the attorney general, (single and aggregate over defined time period);
- e) System voids, overrides, and corrections;
- f) Changes to live data files occurring outside of normal program and operating system execution;
- g) Changes that are made to the download data library, including the addition, changing or deletion of software, where supported;
- h) Changes to policies and parameters for operating systems, databases, networks, and applications (e.g., audit settings, password complexity settings, system security levels, manual updates to databases, etc.);
- i) Changes to date/time on master time server;
- j) Changes to game theme parameters (e.g., game rules, payout schedules, paytables, etc.);
- k) Irrecoverable loss of sensitive information;
- l) Any other activity requiring user intervention and occurring outside of the normal scope of system operation; and
- m) Other significant or unusual events as deemed applicable by the attorney general.

5.6.4 User Access Information

For each user account, the information to be maintained and backed up by the Electronic Instant Bingo System shall include:

- a) Employee name and title or position;
- b) User identification;
- c) Full list and description of functions that each group or user account may execute;
- d) The date and time the account was created;
- e) The date and time of last access, including IP Address;
- f) The date and time of last password change;
- g) The date and time the account was disabled/deactivated;
- h) Group membership of user account (if applicable); and
- i) The current status of the user account (e.g., active, inactive, closed, suspended, etc.).

5.7 Reporting Requirements

5.7.1 General Reporting Requirements

The Electronic Instant Bingo System shall be capable of generating the information needed to compile reports as required by the attorney general. In addition to meeting the requirements in the section above for "[Data Retention and Time Stamping](#)", the following requirements shall apply for required reports:

- a) The system shall be able to provide the reporting information on demand, on a daily basis, and for other intervals required by the attorney general (e.g., month-to-date (MTD), year-to-date (YTD), life-to-date (LTD), etc.).
- b) Each required report shall contain:
 - i. The site or operator's name (or other identifier), name of manufacturer, the title of report, the

Appendix A: Electronic Instant Bingo Technical Standards

- selected interval and the date/time the report was generated;
 - ii. An indication of “No Activity” or similar message if no information appears for the period specified; and
 - iii. Labeled fields which can be clearly understood in accordance with their function.
- c) The system shall be able to identify via report generation, any registered electronic instant bingo devices which have not been actively connected to, or have not reported, data to the manufacturer’s central system within the last [48 hours].
- d) No other additional reports which detail the actual accounting information and specific details relating to current electronic instant bingo activity conducted at a site may be accessible to the Licensed E-Bingo organization. This includes any report data which allows for the determination of the financial status, remaining prizes, or remaining tickets within an active deal.

NOTE: In addition to the reports outlined in this section, the attorney general may also require other reports utilizing the information stored under the “[Information to be Maintained](#)” section of this document.

5.7.2 Electronic Instant Bingo Activity Report

The Electronic Instant Bingo System shall be able to provide the following information needed to compile one or more reports on electronic instant bingo activity:

- a) Device identification or serial number, for each device;
- b) Total cash in, for each device and in total;
- c) Total dollar value of vouchers issued, for each device and in total;
- d) For each game and deal in play, each device, and in total:
 - i. Total dollar value of gross proceeds (plays);
 - ii. Total dollar value of prizes awarded; and
 - iii. Total dollar value of adjusted gross proceeds (gross proceeds less prizes awarded).

5.7.3 Deals in Play Report

The Electronic Instant Bingo System shall be able to provide the following information needed to compile one or more reports on each electronic instant bingo deal currently in play:

- a) Game Name;
- b) Cost per electronic instant bingo ticket;
- c) Number of instant bingo tickets per deal;
- d) Ideal gross proceeds per deal;
- e) Ideal prizes per deal;
- f) The payout percentage per deal;
- g) Total number of deals put into play for the game.
- h) Serial number of each deal; and
- i) Date and time each deal was put into play.

5.7.4 Closed Game Summary Report

The Electronic Instant Bingo System shall be able to provide the following information needed to compile one or more reports on each electronic instant bingo deal which has been closed at a site, as applicable:

Appendix A: Electronic Instant Bingo Technical Standards

- a) Game name;
- b) Total number of deals played in the game;
- c) Total number of electronic instant bingo tickets per deal;
- d) Cost per instant bingo ticket;
- e) Ideal gross proceeds per deal;
- f) Ideal prizes per deal;
- g) Ideal payout percentage per deal;
- h) Serial number of each deal;
- i) Date and time each deal was put into play;
- j) Ideal gross proceeds for game;
- k) Total number of unsold electronic instant bingo tickets in the deal;
- l) Dollar Value of unsold electronic instant bingo tickets;
- m) Final payout percentage for the game;
- n) Total dollar value of gross proceeds (plays) for each game/cost per play and total;
- o) Total dollar value of prizes awarded for each game/cost per play and total including a breakdown of prizes by prize value and quantity of each awarded;
- p) Total dollar value of adjusted gross proceeds (gross proceeds less prizes awarded) for each game/cost per play and total; and
- q) Date and time game was closed.

5.8 Technical Security Controls

5.8.1 Physical Location of Components

The electronic instant bingo central system components shall be housed in Ohio in a secure environment which shall:

- a) Have sufficient protection against alteration, tampering or unauthorized access; and
- b) Be equipped with a surveillance system which provides sufficient coverage with video retrieval for at least 7 days.

5.8.2 Logical Access Control

The Electronic Instant Bingo System shall be logically secured against unauthorized access by authentication credentials, such as passwords, multi-factor authentication, digital certificates, PINs, biometrics, and other access methods allowed by the attorney general (e.g., magnetic swipe, proximity cards, embedded chip cards). The number of users that have the requisite permissions to adjust critical parameters shall be limited.

At a minimum, the system shall limit access as follows:

- a) The electronic instant bingo system must have multiple security access levels to control and restrict different classes of access to the system;
- b) Access accounts for each level in the system must be unique and only one user per account is permitted;
- c) Program and data files in the system must only be accessible with passwords that are securely maintained by the manufacturer, distributor and licensed electronic instant bingo operator;
- d) Storage of passwords in the system must be in an encrypted, nonreversible form; and

Appendix A: Electronic Instant Bingo Technical Standards

e) A report must be available that will list all permitted users on the system,

5.8.3 Data Alteration

The alteration of any accounting, reporting or electronic instant bingo data shall not be permitted without supervised access controls. In the event any data is changed, the following information shall be documented or logged:

- a) Unique ID number for the alteration;
- b) Data element altered;
- c) Data element value prior to alteration;
- d) Data element value after alteration;
- e) Time and date of alteration; and
- f) Personnel that performed alteration (user identification).

5.8.4 Storage Medium Backup

Audit logs, system databases, and any other pertinent sensitive data specified in the under the section entitled “Information to be Maintained” shall be stored using reasonable protection methods for a period of three years or as otherwise specified by the attorney general. The Electronic Instant Bingo System shall be designed to protect the integrity of this data in the event of a failure. Redundant copies of this data shall be kept on the system with open support for backups and restoration, so that no single failure of any portion of the system would cause the loss or corruption of data.

5.8.5 Recovery Requirements

In the event of a catastrophic failure when the Electronic Instant Bingo System cannot be restarted in any other way, it shall be possible to restore the system from the last backup point and fully recover. The contents of that backup shall contain the following critical information including, but not limited to:

- a) The recorded information specified under the section 5.6 (“[Information to be Maintained](#)”);
- b) Specific site or venue information such as configuration, security accounts, etc.;
- c) Current system encryption keys; and
- d) Any other system parameters, modifications, reconfiguration (including participating sites or venues), additions, merges, deletions, adjustments and parameter changes.

5.8.6 Uninterruptible Power Supply (UPS) Support

All Electronic Instant Bingo System components shall be provided with adequate primary power and shall have an Uninterruptible Power Supply (UPS) with sufficient capacity to permit a graceful shut-down and that retains all pertinent sensitive information during a power loss. The system may be a component of a network that is supported by a network-wide UPS provided that the system is included as a component protected by the UPS. There shall be a surge protection system in use if not incorporated into the UPS itself.

5.8.7 Communication Requirements

Appendix A: Electronic Instant Bingo

Technical Standards

Each component of the Electronic Instant Bingo System shall function as indicated by a documented secure communication protocol.

- a) All protocols shall use communication techniques that have proper error detection and recovery mechanisms, which are designed to prevent intrusion, interference, eavesdropping and tampering. Any alternative implementations will be reviewed on a case-by-case basis and approved by the attorney general.
- b) All data communications critical to electronic instant bingo shall employ encryption and authentication. The encryption method shall use different encryption keys so that encryption algorithms can be changed or replaced as soon as practical. Other methodologies shall be reviewed on a case-by-case basis. As a minimum, 128-bit encryption key length is required unless a lesser amount can be demonstrated to be adequate to and approved by the attorney general.
- c) Communications on the secure network shall only be possible between approved critical components that have been enrolled and authenticated as valid on the network. No unauthorized communications to components and/or access points shall be allowed.
- d) After a system interruption or shutdown, communication with all components necessary for system operation shall not be established and authenticated until the program resumption routine, including any self-tests, are completed successfully.

5.8.8 Wireless Local Area Network (WLAN) Requirements

Should Wireless Local Area Network (WLAN) communications be utilized, it must adhere to the following requirements. WLANs used by the Electronic Instant Bingo System must be encrypted in transit using a method (for example, AES, IPsec or WPA2) approved by the attorney general.

- a) WLANs used by the Electronic Instant Bingo System must be separate and not include other devices that are not part of the system.
- b) The Service Set Identifier (SSID) used to identify the WLAN should be hidden and not broadcast.
- c) The WLAN should use MAC address filtering as means to validate whether or not a device may connect to the WLAN.
- d) The Electronic Instant Bingo System should use a device registration method as a means to validate whether or not a device is an authorized device on the system.

NOTE: It is imperative for operators to review and update internal control policies and procedures to ensure the network is secure and threats and vulnerabilities are addressed accordingly. Periodic inspection and verification of the integrity of the WLAN is recommended.

5.8.9 Remote Access Security

Remote access is defined as any access from outside the system or system network including any access from other networks within the same site or venue. Remote access shall:

- a) Be performed via a secured method, such as a multi-factor authentication process;
- b) Have the option to be disabled;
- c) Accept only the remote connections permissible by the firewall application and system settings;
- d) Be limited to only the application functions necessary for users to perform their job duties:
 - i. No unauthorized remote user administration functionality (adding users, changing permissions, etc.) is permitted; and

Appendix A: Electronic Instant Bingo Technical Standards

- ii. Unauthorized access to the operating system or to any database other than information retrieval using existing functions is prohibited.
- e) Be recorded in an activity log, indicating:
 - i. Identification of user(s) who performed and/or authorized the remote access;
 - ii. Remote IP Addresses, Port Numbers, Protocols, and where possible, MAC Addresses;
 - iii. Time and date the connection was made and duration of connection; and
 - iv. Activity while logged in, including the specific areas accessed and changes made.

NOTE: Remote access security will be reviewed on a case-by-case basis, in conjunction with the implementation of the current technology and approval from the attorney general.