PAGCOR TECHNICAL STANDARDS

For
Electronic Gaming Machines
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CHAPTER 1

1.0 OVERVIEW

1.1 Introduction

The Philippine Amusement and Gaming Corporation or PAGCOR is the regulatory authority that supervises and regulates the activities of licensed casinos in the Philippines. Casino licensees must ensure that the gaming machines deployed on their casino floor comply with technical standards as issued by PAGCOR.

The objective of these Standards is to guarantee that wagering on electronic gaming machines in casinos regulated by PAGCOR is conducted in a manner that is fair, secure, consistent, credible and auditable.

These Standards also seeks to establish the requirements for the design and operation of such electronic gaming machines and to provide guidance to testing laboratories/certification entities on the areas of technical compliance with regard to electronic gaming machines.

These technical standards are subject to on-going review, and where necessary or deemed appropriate, PAGCOR reserves the right to unilaterally amend or re-issue this document without notice.

1.2 Acknowledgment of Other Standards Reviewed

1.2.1 General Statement

These Standards were developed by reviewing and using portions of the documents from the groups listed below. We acknowledge these organizations and regulators who have assembled these documents and thank them:

a) Gaming Laboratories International, LLC
b) Gaming Inspection and Coordination Bureau of Macao SAR
c) Casino Regulatory Authority of Singapore
d) Nevada Gaming Control Board

1.3 Purpose of Technical Standards

1.3.1 Purpose

The purpose of these Technical Standards is as follows:

a) To eliminate subjective criteria in analyzing and certifying electronic gaming machine operation.

b) To only test those criteria that impact the credibility and integrity of an electronic gaming machine from both the Revenue Collection and Player's perspective.

c) To create a standard that will insure that electronic gaming machines in casinos are fair, secure, and able to be audited and operated correctly.

d) To distinguish between local public policy and laboratory criteria.

e) To recognize that non-gaming testing (such as Electrical Testing) should not be incorporated into this standard but left to appropriate test laboratories that specialize in that type of testing. Except where specifically identified in the standard, testing is not directed at health or safety matters. These matters are the responsibility of the manufacturer, purchaser, and operator of the equipment.

f) To construct a standard that can be easily changed or modified to allow for new technology.

g) To construct a standard that does not specify any particular method or algorithm. The intent is to allow a wide range of methods to be used to conform to the standards, while at the same time, to encourage new methods to be developed.

1.3.2 No Limitation of Technology

One should be cautioned that this document should not be read in such a way that limits the use of future technology. The document should not be interpreted that if the technology is not mentioned, then it is not allowed. Quite to the contrary, as new technology is developed, we will review this standard, make changes and incorporate new minimum standards for the new technology.

1.4 Definition of Electronic gaming machine

An electronic gaming machine at a minimum will utilize randomness in determination of prizes, contain some form of activation to initiate the selection process, and make use of a methodology for delivery of the determined outcome. The electronic gaming machine may be separated in parts, where some may be within or outside the electronic gaming machine (e.g., electronic gaming machines that function with a system).

CHAPTER 2

2.0 MACHINE REQUIREMENTS – HARDWARE

2.1 Physical Security

2.1.1 General Statement.

The gaming machine (inclusive of its logic area) shall be robust enough to resist forced illegal entry and shall retain evidence of any sign of illegal entry until properly cleared before the initiation of a new play.

2.1.2 Locked Areas of the gaming machine.

The entirety of a gaming machine which does not form part of the player's input interface (e.g. buttons) must be stored within one or more locked areas of the machine.

All locked areas must be equipped with access detection devices/switches, to detect access to all locked areas.

It must not be possible to disable a door opens sensor without first opening the door using the designed manner (e.g. key) or leaving physical evidence of forced entry.

It must not be possible to reset the door open state by software means, if the door open sensor indicates that the door is still open.

2.2 Machine and Player Safety

2.2.1 General Statement.

Electrical and mechanical parts and design principals of the electronic gaming machine may not subject a player to any physical hazards. The gaming test laboratory shall NOT make any finding with regard to Safety and Electromagnetic Compatibility (EMC) testing, as that is the responsibility of the manufacturer of the goods or those that purchase the goods. Such Safety and EMC testing may be required under separate statute, regulation, law, or Act and should be researched accordingly, by those parties who manufacture or purchase said devices. The Gaming Test Laboratory shall not test for, be liable for, nor make a finding relating to these matters.

2.3 Environmental Effects on Game Integrity

2.3.1 Game Integrity Standard.

The Gaming Test Laboratory will perform certain tests to determine whether or not outside influences affect game fairness to the player or create cheating opportunities.
During the course of testing, the Gaming Test Laboratory shall inspect for marks or symbols indicating that a device has undergone product safety compliance testing.

The Gaming Test Laboratory shall also perform where possible, a cursory review of submissions and information contained therein related to Electromagnetic Interference (EMI), Radio Frequency Interference (RFI), Magnetic Interference, Liquid Spills, Power Fluctuations and Environmental Conditions.

Electrostatic Discharge Testing is intended only to simulate techniques observed in the field being used to attempt to disrupt the integrity of Electronic Gaming Machines. Compliance to any such regulations related to the aforementioned testing is the sole responsibility of the device manufacturer. The actual data showing the tests performed and the excluded tests shall be included in the submission. This kind of electrical test of EMI may be conducted by appropriate test labs, such as ICC, UL or CE.

a) **Random Number Generator.** The random number generator and random selection process shall be impervious to influences from outside the device, including, but not limited to, electro-magnetic interference, electro-static interference, and radio frequency interference;

b) **Electro-Static Interference.** Protection against static discharges requires that the electronic gaming machine's conductive cabinets be earthed in such a way that static discharge energy shall not permanently damage, or permanently inhibit the normal operation of the electronics or other components within the electronic gaming machine. Electronic gaming machines may exhibit temporary disruption when subjected to a significant electro-static discharge greater than human body discharge, but they shall exhibit a capacity to recover and complete any interrupted play without loss or corruption of any control or critical data information associated with the electronic gaming machine. The tests will be conducted in accordance with the appropriate parameters set out in IEC 61000-4-2 with a severity level of 20KV to 27KV air discharge.

2.4 Hardware Requirements-Other

2.4.1 General Statement.

Each electronic gaming machine shall meet the following hardware requirements:

a) **Microprocessor Controlled**. Be controlled by one (1) or more microprocessors or the equivalent in such a manner that the game outcome is completely controlled by the microprocessor or a mechanical device, as approved in Section 3.3, 'Random Number Generators (RNG) Requirements; and

b) **On/Off Switch**. An on/off switch that controls the electrical current shall be located in place which is readily accessible within the interior of the electronic gaming machine so that power cannot be disconnected from outside of the electronic gaming machine using the on/off switch. The on/off positions of the switch shall be labeled.

2.5 Electronic Gaming Machine Wiring

2.5.1 General Statement.

The electronic gaming machine shall be designed so that power and data cables into and out of the electronic gaming machine can be routed so that they are not accessible to the general public. This is for game integrity reasons only, not for health and safety. Security-related wires and cables that are routed into a logic area shall be securely fastened within the interior of the device.

2.6 Machine Identification

2.6.1 General Statement.

An electronic gaming machine shall have an identification badge permanently affixed to the exterior of the cabinet by the manufacturer, that is not removable without leaving evidence of tampering and this badge shall include the following information:

a) The name of the manufacturer;
b) A unique serial number;
c) The electronic gaming machine model number; and
d) The date of manufacture.

2.7 Tower Light

2.7.1 General Statement

The electronic gaming machine shall have a light located conspicuously on its top that automatically illuminates when a player has won an amount or is collecting credits that the device cannot automatically pay, an error condition has occurred (including 'Door Open'), or a 'Call Attendant' condition has been initiated by the player. For devices such as the 'bar-top style', it is permissible for the tower light to be shared among other electronic gaming machines or be substituted by an audible alarm.

2.8 Manipulation of Power Supply

2.8.1 Power Supply and Surges

a) The gaming machine must operate from electric mains power of nominally 220V 50HZ.

b) The gaming machine shall comply with the requirements of IEC 61000-3-2 class D for harmonic currents when operated at nominal mains voltage.

c) The gaming machine shall be unaffected by Electrical Fast Transients as defined by IEC 61000-4-4. Criteria shall be 2.5kV polarities, each conductor, 5ns rise, 50ns duration, 5kHz, one minute.

d) The gaming machine shall be unaffected by continuous operation when supplied with mains electric power that deviates from the nominal voltage by +10%.

e) The gaming machine shall either be unaffected by or shall recover from:

- A surges or dip of + 20% of the supply voltage that lasts for 600 seconds;
- Voltage dips and interruptions as define in IEC 61000-4-11, 30% dip 500ms;
- Electrical surge as defined in IEC 61000-4-5 2kV line to line and 2kV line to earth;
- Repeated switching on and off the AC power supply; and
- Jiggling the AC cord at the wall outlet.

The electronic gaming machine shall not be adversely affected, other than resets, by surges or dips of ± 20% of the supply voltage.

NOTE: It is acceptable for the equipment to reset provided no damage to the equipment or loss or corruption of data is experienced in the field. Upon reset, the game must return to its previous state. It is acceptable for the game to return to a game completion state provided the game history and all credit and accounting meters comprehend a completed game.

2.9 Diverter and Drop Box Requirements

2.9.1 Diverter

For games that accept coins or tokens, the software shall ensure that the diverter directs coins to the hopper, or to the drop box when the hopper is full. The hopper full detector shall be monitored to determine whether a change in diverter status is required. If the state of the detector changes, the diverter shall operate as soon as possible, or within ten (10) games, after the state change, without causing a disruption of coin flow, or creating a coin jam. Hopper-less electronic gaming machines shall always divert coins to the drop box.

2.9.2 Drop Box

If the electronic gaming machine is equipped to accept coins or tokens, then the following rules shall be met:

a) Each electronic gaming machine equipped to accept coins or tokens shall contain a separate drop bucket or drop box to collect and retain all such coins or tokens that are diverted into the drop box;

b) A drop bucket shall be housed in a locked compartment separate from any other compartment of the electronic gaming machine; and

c) There must be a method to monitor the drop box area, even if manufactured by a different company. It is preferred that the monitoring method provide for notification to the online system.

2.10 Requirements for External Doors / External Compartments

2.10.1 General Requirements

a) Doors shall be manufactured of materials that are suitable for allowing only legitimate access to the inside of the cabinet (i.e., locks, doors, and their associated hinges shall be capable of withstanding determined and unauthorized efforts to gain access to the inside of the electronic gaming machine and shall leave evidence of tampering if such an entry is made);

b) The seal between the cabinet and the door of a locked area shall be designed to resist the entry of objects;

c) All external doors shall be locked and monitored by door access sensors, which when opened shall cease game play (with the exception of a drop box door), disable all acceptance, and enter an error condition, which at a minimum shall illuminate the tower light and send the error condition to the on-line system, when applicable;

d) It shall not be possible to insert a device into the electronic gaming machine that will disable a door open sensor when the electronic gaming machine’s door is shut without leaving evidence of tampering; and

e) The sensor system shall register an external door as being open when the door is moved from its fully closed and locked position, provided power is supplied to the device.

2.11 The Logic Door and Logic Area

2.11.1 General Statement

The program or logic area is a separately locked cabinet area (with its own locked door), which houses electronic components that have the potential to significantly influence the operation of the electronic gaming machine. There may be more than one (1) such logic area in a electronic gaming machine. The logic door shall be monitored.

2.11.2 Electronic Components

Electronic components that are required to be housed in one (1) or more logic areas are:

a) A CPU and any program storage device that contains software that may affect the integrity of gaming including, but not limited to, the game accounting, system communication, and peripheral firmware devices involved in, or which significantly influence, the operation and calculation of game play, game display, game result determination, or game accounting, revenue, or security. Any exceptions will be evaluated on a case-by-case basis;

b) Communication controller electronics and components housing the communication program storage device. Any exceptions will be evaluated on a case-by-case basis; and

c) The Non-Volatile (NV) memory back-up device, if applicable, shall be kept within a locked logic area.

2.12 Coin/Token and Currency Compartments

2.12.1 General Statement

The coin or token and currency compartments shall be locked separately from the main cabinet area. A separate coin/token compartment shall not be required for coins or tokens necessary to pay prizes in an electronic gaming machine that pays prizes through a hopper.

2.12.2 Access to Currency

a) Access to the currency storage area is to be secured via separate key locks and shall be fitted with sensors that indicate door open/close or stacker receptacle removed, provided power is supplied to the device.

b) Access to the currency storage area is to be through two (2) levels of locks (the relevant outer door plus one other door or lock) before the currency can be removed.

2.13 Program Memory, Non-Volatile Memory and Non-Volatile Devices Used to Store Program Memory

2.13.1 Non-Volatile (NV) Memory Requirements

a) The electronic gaming machine shall have the ability to retain data for all critical memory as defined herein and shall be capable of maintaining the accuracy of all information required for thirty (30) days after power is discontinued from the electronic gaming machine;

b) A proven and reliable mechanism shall be implemented to check for any corruption of critical memory locations used for crucial gaming machine functions.

c) For rechargeable battery types only, if the battery back-up is used as an 'off chip' battery source, it shall re-charge itself to its full potential in a maximum of twenty-four (24) hours. The shelf life shall be at least five (5) years;

d) NV memory that uses an off-chip back-up power source to retain its contents when the main power is switched off shall have a detection system which will provide a method for software to interpret and act upon a low battery condition before the battery reaches a level where it is no longer capable of maintaining the memory in question; and

e) Clearing non-volatile memory shall require access to the locked logic area or other secure method provided that the method can be controlled by the regulatory body.

2.13.2 Function of NV Memory / RAM Reset

Following the initiation of an NV memory reset procedure (utilizing a certified NV memory clear method), the game program shall execute a routine, which initializes all bits in critical NV memory to the default state. All memory locations intended to be cleared as per the NV memory clear process shall be fully reset in all cases. For games that allow for partial NV memory clears, the methodology in doing so must be accurate.

2.13.3 Default Reel Position or Game Display

The default reel position or game display immediately after an NV memory reset shall not be the advertised top award on any selectable line. The default game display, upon entering game play mode, shall also not be the advertised top award.

This applies to the base game only and not to any secondary bonus features. This does not apply to games or paytables selected after the initial game play.

2.13.4 Configuration Settings

It shall not be possible to change a configuration setting that causes an obstruction to the electronic accounting meters without an NV memory clear. Notwithstanding, a change to the denomination must be performed by a secure means, which includes access to the locked logic area or other secure method provided that the method can be controlled by the regulator (e.g., Password or PIN-based controls) .

2.14 Contents of Critical Memory

2.14.1 General Statement

Critical memory is used to store all data that is considered vital to the continued operation of the electronic gaming machine. This includes, but is not limited to:

a) All electronic meters required in ‘Electronic Metering within the electronic gaming machine’, including last bill data and power up and door open metering;

b) Current credits;

c) Electronic gaming machine/game configuration data;

d) Information pertaining to the last ten (10) games with the game outcome (including the current game, if incomplete). Electronic gaming machines offering games with a variable number of free games, per base game, may satisfy this requirement by providing the capability to display the last 50 free games in addition to each base game;

e) Software state (the last normal state, last status or tilt status the electronic gaming machine software was in before interruption);

f) Any paytable configuration information residing in memory; and

g) It is a recommendation that, at minimum, a log of the last 100 significant events be kept in critical memory.

2.15 Maintenance of Critical Memory

2.15.1 General Statement

Critical memory storage shall be maintained by a methodology that enables errors to be identified. This methodology may involve signatures, checksums, partial checksums, multiple copies, timestamps and/or effective use of validity codes.

NOTE: The “Maintenance of Critical Memory” 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.

2.15.2 Comprehensive Checks

a) Comprehensive checks of the relevant contents of the electronic gaming machine’s critical memory shall be undertaken at least after:

- Every restart of the device; and
- When the logic door is closed

b) After a restart (e.g. power off and on), the device must complete its validity check of the entire critical memory storage area and then perform a comparison check of all good logical copies of critical memory.

c) Any failure of a validity check is to be considered either:

- A recoverable memory corruption if at least one copy of critical memory is established to be good, or

- An unrecoverable memory corruption

It is recommended that critical memory is continuously monitored for corruption. The methodology shall detect failures with an extremely high level of accuracy.

2.15.3 General Statement

An unrecoverable corruption of critical memory shall result in an error. The memory error shall not be cleared automatically and shall result in a tilt condition, which facilitates the identification of the error and causes the electronic gaming machine to cease further function. The critical memory error shall also cause any communication external to the electronic gaming machine to immediately cease. An unrecoverable critical memory error shall require a full NV memory clear performed by an authorized person.

2.15.4 NV Memory and Program Storage Device Space.

Non-volatile memory space that is not critical to electronic gaming machine security (e.g., video or sound) is not required to be validated.

2.16 Program Storage Device Requirements

2.16.1 General Statement

The term Program Storage Device is defined to be the media or an electronic device that contains the critical control program components. Device types include but are not limited to EPROMs, compact flash cards, optical disks, hard drives, solid state drives, USB drives, etc. This partial list may change as storage technology evolves. All program storage devices shall:

a) Be housed within a fully enclosed and locked logic compartment;

b) Be clearly marked with sufficient information to identify the software and revision level of the information stored in the device. In the case of media types on which multiple programs may reside it is acceptable to display this information via the attendant menu.

c) Validate themselves during each processor reset;

d) Validate themselves the first time they are used; and

e) CD-ROM, DVD, and other optical disk-based Program Storage shall:

- Not be a re-writeable disk; and
- The “Session” shall be closed to prevent any further writing.

f) A proven and robust mechanism shall be implemented to internally authenticate that the program files and/or support files had not been corrupted or altered prior to use/loading. The mechanism shall prevent further play of the gaming machine if unexpected data or inconsistencies are found.

2.17 Control Program Requirements

2.17.1 Control Program Verification

a) EPROM-based Program Storage:

Electronic gaming machines which have control programs residing in one or more EPROMs must employ a mechanism to verify control programs and data. The mechanism must use, at a minimum, a checksum; however, it is recommended that a Cyclic Redundancy Check (CRC) be used (at least 16-bit).

b) Non-EPROM Program Storage shall meet the following rules:

- The software shall provide a mechanism for the detection of unauthorized and corrupt software elements, upon any access, and subsequently prevent the execution or usage of those elements by the electronic gaming machine. The

mechanism must employ a hashing algorithm which produces a message digest output of at least 128 bits.

- In the event of a failed authentication, after the game has been powered up, the electronic gaming machine should immediately enter an error condition and display an appropriate error. This error shall require operator intervention to clear and shall not clear until; the data authenticates properly, following the operator intervention, or the media is replaced or corrected, and the electronic gaming machine's memory is cleared.

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

c) Alterable Media shall meet the following rules in addition to the requirements outlined in 2.17.1(b):

- Employ a mechanism which tests unused or unallocated areas of the alterable media for unintended programs or data and tests the structure of the media for integrity. The mechanism must prevent further play of the electronic gaming machine if unexpected data or structural inconsistencies are found.

- Employ a mechanism for keeping a record any time a control program component is added, removed, or altered on any alterable media. The record shall contain a minimum of the last ten (10) modifications to the media and each record must contain that date and time of the action, identification of the component affected, the reason for the modification and any pertinent validation information.

  NOTE: Alterable Program Storage does not include memory devices typically considered to be alterable which have been rendered "read-only" by either a hardware or software means.

2.17.2 Program Identification

Program storage devices which do not have the ability to be modified while installed in the electronic gaming machine during normal operation shall be clearly marked with sufficient information to identify the software and revision level of the information stored in the devices.

2.17.3 Independent Control Program Verification

The device shall have the ability to allow for an independent integrity check of the device's software from an outside source and is required for all control programs that may affect the integrity of the game. This must be accomplished by being authenticated by a third-party device, which may be embedded within the game software (see NOTE below), by having an interface port for a third-party device to

authenticate the media, or by allowing for removal of the media such that it can be verified externally. This integrity check will provide a means for field verification of the software to identify and validate the program. The test laboratory, prior to device approval, shall evaluate the integrity check method.

NOTE: If the authentication program is contained within the game software, the manufacturer must receive written approval from the test laboratory prior to submission.

2.18 Multi-Station Games

2.18.1 General Statement

A Multi-Station game is an electronic gaming machine unit that incorporates more than one (1) player terminal, and that only has one (1) random number generator, which is controlled by the master terminal. The master terminal, containing the game's Central Processing Unit (CPU) shall determine the outcome of the game based on RNG results. The master terminal will house the game display which is shared among the player terminals. Each terminal shall meet the applicable technical standards outlined throughout this document including electronic gaming machine identification and metering. This rule does not apply to "Central Determined" type games nor does it apply to "Community Bonus" style games. There must be a method for each player to know when the next game will begin.

2.18.2 Electronic gaming machines

As applicable, the electronic gaming machines must meet the hardware requirements and software requirements of this document.

2.18.3 Master Terminal

The master terminal, which contains the Random Number Generator, must meet the hardware requirements and software requirements of this document. Please note that the coin and bill validator requirements would not apply to the master terminal.

2.19 Printed Circuit Board (PCB)

2.19.1 PCB Identification Requirements

The requirements for PCB identification shall include the following:

a) Each printed circuit board (PCB) shall be identifiable by some sort of name (or number) and revision level. Where feasible, this identification should be readily viewed without removal of the PCB from the electronic gaming machine;

b) The top assembly revision level of the PCB shall be identifiable;

c) If track cuts and/or patch wires are added to the PCB, then a new revision number or level shall be assigned to the assembly;

d) Manufacturers shall ensure that circuit board assemblies, used in their electronic gaming machines, conform functionally to the documentation and the certified versions of those PCBs that were evaluated and certified by the test laboratory; and

e) The manufacturer's name, logo, or abbreviated symbol is recommended.

2.20 Patch Wires

2.20.1 Documentation of Patch Wires & Track Cuts

All patch wires and track cuts shall be documented, in an appropriate manner, in the relevant service manual and/or service bulletin and shall be submitted to the test laboratory. This does not prohibit required repairs in the field.

2.21 Switches and Jumpers

2.21.1 General Statement

If the electronic gaming machine contains switches and/or jumpers, the following rules shall be met:

a) All hardware switches or jumpers shall be fully documented for evaluation by the test laboratory; and

b) Hardware switches and/or jumpers which may alter the jurisdictional specific configuration settings, paytables, game denomination, or payout percentages must meet applicable sections of this document and must be housed within a logic compartment of the electronic gaming machine. This includes top award changes (including progressives), selectable settings, or any other option that would affect the payout percentage.

2.22 Mechanical Devices Used for Displaying of Game Outcomes

2.22.1 General Statement

If the game has mechanical or electro-mechanical devices, which are used for displaying game outcomes, the following rules shall be observed:

a) Electro-mechanically controlled display devices (e.g. reels or wheels) shall have a sufficiently closed loop of control so as to enable the software to detect a malfunction, and/or any attempt to interfere with the correct operation of that device. This requirement is designed to ensure that if a reel or wheel is not in the position it is supposed to be in, an error condition will be generated;

b) Mechanical assemblies (e.g., reels or wheels) shall have some mechanism that ensures the correct mounting of the assembly's artwork, if applicable;

c) Displays shall be constructed in such a way that winning symbol combinations match up with pay lines or other indicators; and

d) A mechanical assembly shall be so designed that it is not obstructed by any other components.

2.23 Video Monitor/Touch Screens

2.23.1 General Statement

All video monitor touch screens shall meet the following rules:

a) Touch screens shall be accurate and once calibrated, shall maintain that accuracy for at least the manufacturer's recommended maintenance period;

b) A touch screen should be able to be re-calibrated without access to the electronic gaming machine cabinet other than opening the main door; and

c) There shall be no hidden or undocumented buttons/touch points anywhere on the screen that affect game play and/or that impact the outcome of the game, except as provided for by the game rules.

2.24 Coin or Token, Bill Validators & Other Methods of Inserting Financial Instruments into the Electronic gaming machine

2.24.1 Coin or Token Acceptors

If the electronic gaming machine uses a coin/token acceptor, the acceptor must be able to deliver the coin to the correct area of the electronic gaming machine. The device shall also accept or reject the coin/token on the basis of metal composition, mass, composite makeup, or an equivalent method to securely identify a valid coin/token. In addition, it shall meet the following rules:

a) **Credit Meter Update on Coin/Token Insertion.** Each valid coin/token inserted shall register the actual monetary value or the appropriate number of credits received for the denomination being used on the player's credit meter for the current game or bet meter. If registered directly as credits, the conversion rate

shall be clearly stated, or be easily ascertainable from the electronic gaming machine;

b) **Coin/Token Acceptor Security Features/Error Conditions.** The coin acceptor shall be designed to prevent the use of cheating methods including; but not limited to, slugging (counterfeit coins), stringing (coin pullback), the insertion of foreign objects and any other manipulation that may be deemed as a cheating technique. Appropriate correlating error conditions shall be generated and the coin acceptor shall be disabled;

c) **Rapidly Fed Coins.** The electronic gaming machine shall be capable of handling rapidly-fed coins/tokens or piggy backed coins/tokens so that occurrences of cheating are eliminated. Coins traveling too fast that do not register on the player's credit meter shall be returned to the player;

d) **Direction Detectors.** The electronic gaming machine shall have suitable detectors for determining the direction and the speed of coin/token travel in the receiver. If a coin/token traveling at too slow of a speed or improper direction is detected, the electronic gaming machine shall display a suitable error condition for at least thirty (30) seconds or be cleared by an attendant.

e) **Invalid Coins/Tokens.** Coins/tokens deemed invalid by the acceptor shall be rejected to the coin tray and shall not be counted as credits;

f) **Coin Acceptor Error Conditions.** Coin acceptors shall have a mechanism to allow software to interpret and act upon the following conditions:

- Coin-in jam;
- Coin return jam;
- Reverse coin-in (coin traveling wrong direction through acceptor); and
- Coin too slow.

NOTE: It is acceptable to report coin-in jam, reverse coin-in and coin too slow as a generic coin-in error.

2.24.2 Bill Validators

All paper currency acceptance devices shall be able to detect the entry of valid bills, coupons, ticket/vouchers, or other approved notes, as applicable, and provide a method to enable the electronic gaming machine software to interpret and act appropriately upon a valid or invalid input. The paper currency acceptance device(s) shall be electronically based and be configured to ensure that they only accept valid bills of legal tender, coupons, ticket/vouchers, or other approved notes, and must reject all other items. Rejected bills, ticket/vouchers, coupons or other approved notes should be returned to the player. Ticket/vouchers are paper slips that are treated as a unit of currency, which may be redeemed for cash or exchanged for credits on the electronic gaming machine. Coupons are paper slips primarily used for

promotional purposes, which may be of a cashable or non-cashable value. The bill input system shall be constructed in a manner that protects against vandalism, abuse, or fraudulent activity. Interconnecting cables from the bill validator to the electronic gaming machine must not be exposed external to the electronic gaming machine or readily accessible to unauthorized staff. In addition, bill acceptance device(s) shall meet the following rules for all acceptable types of medium:

a) Bill acceptors shall be configured to accept multiple pre-approved currencies (i.e., Philippine Peso, United States Dollar, Hong Kong Dollar);
b) Each valid bill, coupon, ticket/voucher or other approved note shall register the actual monetary value or the appropriate number of credits received for the denomination being used on the player's credit meter;

c) Under no circumstances shall credits be lost if bills are accepted by the EGM (except if a power failure occurs during acceptance of a bill or other note, the bill validator shall give proper credits or return the note, notwithstanding that there may be a small window of time where power may fail and credit may not be given). In this case, the window shall be less than one (1) second.

d) Credit meter update upon bill insertion. Credits shall only be registered when:

- The bill or other note has passed the point where it is accepted and stacked; and
- The acceptor has sent the "irrevocably stacked" message to the electronic gaming machine;

e) Bill validator security features. 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 as a cheating technique. A method for detection of genuine bills must be implemented;

f) Credit acceptance conditions. Acceptance of any bills, ticket/vouchers, coupons or other approved notes for crediting to the credit meter shall only be possible when the electronic gaming machine is enabled for play. Other states, such as error conditions, including door opens, audit mode and game play, shall cause the disabling of the bill validator system; with the exception of allowing credit acceptance during game play for devices that allow players to place bets on upcoming events (e.g. horse racing wagering);

g) Bill validator error conditions. Each electronic gaming machine and/or bill validator shall have the capability of detecting and displaying the following error conditions (for bill validators, it is acceptable to disable or flash lights with respect to the bill validator itself):

- 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.;
- Bill jams;

- Stacker door open. (The stacker door is the door immediately prior to accessing the cashbox/stacker assembly);
- Stacker removed; and
- Bill validator malfunction not specified above.

2.24.3 Communications

All bill validators shall communicate with the electronic gaming machine using a bi-directional protocol. Pulse stream interface or serial communication must have error detection. A message with error must either be corrected or rejected.

2.24.4 Factory Set Bill Validators

If bill validators are designed to be factory set only, it shall not be possible to access or conduct maintenance or adjustments to those bill validators in the field, other than:

a) The selection of desired acceptance for bills, coupons, ticket/vouchers, or other approved notes and their limits;

b) Changing of certified 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 should not be allowed externally to the electronic gaming machine. Adjustments of the tolerance level should only be allowed with adequate levels of security in place. This can be accomplished through lock and key, physical switch settings, or other accepted methods approved on a case-by-case basis;

d) Maintenance, adjustment, and repair per approved factory procedures; or

e) Options that set the direction or orientation of acceptance.

2.24.5 Tokenization

For games that allow tokenization, the game shall receive monetary value from the bill or coin acceptor and post to the player's credit meter the entire amount inserted and display any fractional credits when applicable. It is acceptable for the device to store the fractional credits if one of the following conditions is met:

a) The game displays the credit meter in Philippine Pesos and cents; or

b) The game informs the player that there are fractional credits stored on the device at an opportune time to avoid the possibility of the player walking away from the electronic gaming machine without such knowledge.

For specifics on how residual credits should be handled and displayed, please refer to the Tokenization/Residual Credits Sections 3.10.

2.25 Machine Metering of Bill Validator Events

2.25.1 General Statement

An electronic gaming machine, which contains a bill validator device, shall maintain sufficient electronic metering to be able to display the following:

a) Total monetary value of all items accepted;

b) Total number of all items accepted

c) Total monetary value of all bills accepted

d) The number of bills accepted for each bill denomination

e) For all other notes (ticket/vouchers and coupons) the EGM shall have a separate meter that reports the number of items accepted, excluding bills.

2.25.2 Bill Validator Recall

An electronic gaming machine that uses a bill validator shall retain in its memory and display the information required in 2.25.1 of the last five (5) items accepted with time stamp by the bill validator (i.e. Currency, ticket/vouchers, coupons, etc.) The bill validator recall log may be combined or maintained separately by item type. If combined, the type of item accepted shall be recorded with the respective timestamp.

2.26 Acceptable Bill Validator Locations

2.26.1 Bill Validator Location

If an electronic gaming machine is equipped with a bill validator, it shall be located in a locked area of the electronic gaming machine (e.g., require opening of the main door to access), but not in the logic area. Only the bill, ticket/voucher insertion area will be accessible by the player.

2.27 Bill Validator Stacker Requirements

2.27.1 General Statement

Each bill validator shall have a secure stacker and all accepted items shall be deposited into the secure stacker. The secure stacker and its receptacle are to be

attached to the electronic gaming machine 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.
b) The stacker shall be locked independently of the main cabinet and logic area.

c) The stacker must be fitted with sensors that indicate stacker door open/close or stacker removed.

d) A separate lock shall be required to remove bills from the stacker.

e) There must be a sensor which detects and reports to the software whenever there is access to the bill door or the stacker has been removed.

2.28 Credit Redemption

2.28.1 Credit Redemption.

Available credits may be collected from the electronic gaming machine by the player pressing a collect or cash out button at any time other than:

a) During a play

b) While in audit mode

c) While any door open condition exists

d) While in test mode

e) While the player's credit meter or total wins meter is incrementing

f) While any fault condition exists, excluding:

- Progressive controller failure (except when the progressive controller is required to validate the payment); and

- Bill acceptor full

2.28.2 Cashout Limit Exceeded

If credits are collected, and the total credit value is greater than or equal to a specific limit (e.g., hopper limit for hopper games, printer limit for printer games, etc.), the game shall lock up until the credits have been paid, and the handpay is cleared by an attendant.

NOTE: In certain situations the printing of multiple independent tickets, each below the ticket limit, is an acceptable alternative, if approved by the regulatory body.

2.28.3 Requirements for Gaming Machines with both Coin and Bill Acceptors

a) The electronic gaming machine shall be able to cater for simultaneous input of bills and coins

b) Any electronic gaming machine that has both a coin and a bill acceptor shall have the security features as follows:

- Access to the coin drop box is not to give access to the bill storage area
- Access to the bill storage area is not to give access to the coin drop box.

2.29 Coin Hoppers

2.29.1 General Statement

Coin Hoppers shall have detection devices that provide a method of enabling software to interpret and act upon the following conditions:

a. Hopper full, when the hopper full condition is detected, coins are to be diverted to the drop box (this hopper full level must incorporate a physical sensor); Note: The hopper level adjust mechanism may be incorporated into the electronic gaming machine's software in conjunction with a physical sensor which can over-ride the software counter.

b. Hopper empty/hopper jam; and

c. Extra coin paid/hopper runaway (one or more unintended coins exiting the hopper) When possible' the manufacturer is to distinguish between the hopper runaway and the extra coin paid out condition

In addition, coin hoppers shall prohibit manipulation by the insertion of a light source or any foreign object and there shall not be an abnormal payout when exposed to higher levels of electro-static discharge or if power is lost at any time during a payout.

NOTE: Activities that result in the payout of a single extra coin (e.g. the removal and reinsertion of the hopper) are not considered an abnormal payout as long as it is accounted for as an extra coin paid.

2.29.2 Acceptable Hopper Locations

If a electronic gaming machine is equipped with a hopper, it shall be located in a locked area of the electronic gaming machine, but not in the logic area or the drop box. Access to the hopper shall require at a minimum opening of a secure external door.

2.29.3 Hopper Error Conditions

An electronic gaming machine that is equipped with a hopper shall have mechanisms to allow control program software to interpret and act upon the following conditions:

a) Hopper empty or timed out;

b) Hopper jam; and

c) Hopper runaway or extra coin paid out.

2.30 Printers

2.30.1 Payment by Ticket/Voucher Printers

If the electronic gaming machine has a printer that is used to make payments, the electronic gaming machine may pay the player by issuing a printed ticket/voucher. The printer shall print on a ticket/voucher as indicated in section 2.32 and the electronic gaming machine shall support the transmission of data to an on-line data system that records the following information regarding each payout ticket/voucher printed:

a) Value of credits in local monetary units in numerical form;

b) Time of day the ticket/voucher was printed in twenty-four (24) hour format showing hours and minutes;

c) Date, in any recognized format, indicating the day, month, and year;

d) Electronic gaming machine number or machine number;

e) Unique validation number.

To further meet this requirement, the electronic gaming machine shall either keep a duplicate copy or print only one (1) copy to the player but have the ability to retain the last twenty-five (25) ticket/voucher-out information* to resolve player disputes. In addition, an approved system shall be used to validate the payout ticket/voucher, and the ticket/voucher information on the central system shall be retained at least as long as the ticket/voucher is valid at that location. If offline voucher issuance is

supported, the gaming machine MUST mask all but the last 4 digits of the validation number as displayed in the twenty-five (25) ticket/voucher-out log.

* The ticket/voucher-out log may contain ticket/vouchers and receipts.

2.30.2 Printer Location

If a electronic gaming machine is equipped with a printer, it shall be located in a locked area of the electronic gaming machine (i.e., require opening of a locked external door), but not be housed within the logic area or the drop box.

2.30.3 Printer Error Conditions

A printer shall have mechanisms to allow control program software to interpret and act upon the following conditions:

a) Out of paper/paper low. It is permissible for the electronic gaming machine to not lock up for these conditions; however, there should be a means for the attendant to be alerted;

b) Printer jam/failure; and

c) Printer disconnected. It is permissible for the electronic gaming machine to detect this error condition when the game tries to print.

2.31 Ticket/Voucher Validation

2.31.1 General Statement

Voucher In/Voucher Out is allowed only when the electronic gaming machine is connected to a CMS (Casino Monitoring System) and the validation information is generated from the CMS.

2.31.2 Ticket Validation Numbers

a) Ticket validation numbers must be unique – i.e. the ticket support system must ensure that a repeated validation number cannot happen even if there is a total replacement of a gaming machine.

b) Ticket validation numbers must use methodology to prevent prediction of subsequent validation numbers without detailed knowledge of the algorithm and parameters.

c) Gaming machines shall have the capability to display a complete transaction history for the most recent 25 voucher in and voucher out transactions.

2.31.3 Voucher In

a) The acceptance device must be able to detect the entry of a valid voucher by reading its barcode or other unique identifier via the bill acceptor or other barcode reading device.

b) If the Voucher is valid, it will be stacked and the appropriate credits will be transferred to the player account. The acceptance of the voucher is similar to the acceptance of bills.

c) If the voucher is invalid, the voucher system will notify the electronic gaming machine that the voucher is invalid.

d) If the voucher control system is offline, the EGM must always reject the ticket and return it to the player.

2.31.4 Ticket Barcodes

Barcodes or another form of machine readable markings on a ticket must have enough redundancy and error checking to ensure that not less than 99.9% of all misreads are flagged as an error.

2.31.5 Payment by Ticket/Voucher Printer

Payment by ticket/voucher printer as a method of credit redemption is only permissible when:

a) The electronic gaming machine is linked to a computerized 'Ticket/Voucher Validation System', which allows validation of the printed ticket/voucher. Validation approval or information shall come from the Ticket/Voucher validation system in order to validate ticket/vouchers. Ticket/vouchers may be validated at any location, as long as it meets the standards in this section. Provisions must be made if communication is lost, and validation information cannot be sent to the validation system, thereby requiring the manufacturer to have an alternate method of payment. The validation system must be able to identify duplicate ticket/vouchers to prevent fraud by reprinting and redeeming a ticket/voucher that was previously issued by the electronic gaming machine; or

b) By use of an approved alternative method that includes the ability to identify duplicate ticket/vouchers to prevent fraud by reprinting and redeeming a ticket/voucher that was previously issued by the electronic gaming machine.

2.32 Ticket/Voucher Information

2.32.1 General Statement

A ticket/voucher shall contain the following printed information at a minimum:

a) Casino Name/Site Identifier (It is permissible for this information to be contained on the ticket stock itself);

b) Machine Number (or cashier/change booth location number, if ticket/voucher creation outside of the electronic gaming machine is supported);

c) Date and Time (24hr format which is understood by the local date/time format);

d) Alpha and numeric Philippine Peso amount of the ticket/voucher;

e) Ticket/voucher sequence number;

f) Validation number (including a copy of the validation number on the leading edge of the ticket/voucher);

g) Bar code or any machine readable code representing the validation number;

h) Type of transaction or other method of differentiating ticket/voucher types (assuming multiple ticket/voucher types are available). Additionally, it is strongly recommended that whenever the ticket/voucher type is itself a non-cashable item and/or just a receipt, that the ticket explicitly expresses that it has “no cash value”;

i) Indication of an expiration period from date of issue, or date and time the ticket/voucher will expire (24hr format which is understood by the local date/time format). It is permissible for this information to be contained on the ticket stock itself. (e.g. “Expires in One Year”); and

j) If offline voucher issuance is supported, an offline authentication identifier must, at a minimum, be printed on the immediate next line following the leading edge validation number that in no way overwrites, or otherwise compromises, the printing of the validation number on the ticket (not required for ticket/vouchers that are non-redeemable at a gaming machine). The offline authentication identifier must be derived by a hash, or other secure encryption method of at least 128 bits, that will uniquely identify the voucher, verify that the redeeming system was also the issuing system, and validate the amount of the voucher. For cases where a suitable authentication identifier is not printed on the voucher, the electronic gaming machine must print at most one wagering instrument after the electronic gaming machine to system communications has been lost.

NOTE: Some of the above-listed information may also be part of the validation number or barcode. Multiple barcodes are allowed and may represent more than just the validation number.

2.33 Ticket/Voucher Issuance and Redemption

2.33.1 Ticket/Voucher Issuance

A ticket/voucher can be generated at a electronic gaming machine through an internal printer. Ticket/vouchers that reflect partial credits may be issued automatically from a electronic gaming machine. Additionally, cashier/change booth issuance is permitted if supported by the validation system.

2.33.2 Offline Ticket/Voucher Issuance

The electronic gaming machine must meet the following minimum set of requirements to incorporate the ability to issue offline vouchers after a loss of communication has been identified by the electronic gaming machine.

a) **Rules for Issuance.** The electronic gaming machine shall not issue more offline vouchers than has the ability to retain and display in the electronic gaming machine maintained ticket out log.

b) **Request for Re-Seeding.** The electronic gaming machine shall not request validation numbers and seed, key, etc. values used in the issuance of vouchers until all outstanding offline voucher information has been fully communicated to the ticket/voucher validation system.

c) **Rules for Re-Seeding.** The electronic gaming machine shall request a new set of validation numbers and seed, key, etc. values used in the issuance of online/offline voucher if the current list of validation numbers and seed, key, etc. values have the possibility of being compromised which include but are not limited to the following cases:

- After power has been recycled, and/or
- Upon exit of a main door open condition.

d) The values for the seed, key, etc. must never be viewable through any display supported by the electronic gaming machine. Additionally, validation numbers must always be masked when viewable through any display supported by the electronic gaming machine such that only the last 4 digits of the validation number are visible.

2.33.3 Online Ticket/Voucher Redemption

Ticket/vouchers may be inserted in any electronic gaming machine participating in the validation system providing that no credits are issued to the electronic gaming machine prior to confirmation of ticket/voucher validity.

2.33.4 Offline Ticket/Voucher Redemption

The offline ticket/voucher redemption may be validated as an internal control process at the specific electronic gaming machine that issued the ticket/voucher. A manual handpay may be conducted for the offline ticket/voucher value.

CHAPTER 3

3.0 SOFTWARE REQUIREMENTS

3.1 Introduction

3.1.1 General Statement

This section of the document shall set forth the technical requirements for the rules of play of the game and related player displays.

3.2 Rules of Play

3.2.1 Display

a) **Payglass/Video Display.** Payglass or video displays shall be clearly identified and shall accurately state the rules of the game and the award that will be paid to the player when the player obtains a specific win.

b) The payglass or video displays shall clearly indicate whether awards are designated in credits, currency, or some other unit.

c) The electronic gaming machine shall reflect any change in award value, which may occur in the course of play. This may be accomplished with a digital display in a conspicuous location of the electronic gaming machine, and the game must clearly indicate as such.

d) All paytable information, rules of play, and help screen information should be able to be accessed by a player, prior to them committing to a bet. This includes unique game features, extended play, free spins, double-up, take-a-risk, auto play, countdown timers, symbol transformations, and community style bonus awards.

e) Payglass or video displays shall not be certified if the information is inaccurate.

f) **Upcoming Wins.** The game shall not advertise ‘upcoming wins,’ for example “three (3) times pay coming soon”. Notwithstanding the foregoing, a game may display such advertising if:

- It is mathematically demonstrable that an award occurrence is upcoming; and
- If the player is shown a graphical representation in the form of a progress indicator it must accurately depict the current progress towards such an award.

g) **Bonus Feature Information.** Each game which offers a feature such as free games or a fever mode must display the number of feature games that are remaining, during each game.

h) Multiple Decks of Cards. Any games, which utilize multiple decks of cards, shall alert the player as to the number of card decks in play.

i) Any game instruction that appear on the video screen must be accessible and visible without the need for credits to inserted or wagered. This requirement does not apply to messages that will be displayed which are specific instructions that may be required to proceed to the next stage of the game.

3.2.2 Information to be Displayed

An electronic gaming machine shall display, or shall have displayed on the glass, the following information to the player at all times the electronic gaming machine is available for player input:

a) The player's current credit balance;

b) The current bet amount. This is only during the base game or if the player can add to the bet during the game;

c) All possible winning outcomes, or be available as a menu item or on the help menu;

d) Win amounts for each possible winning outcome, or be available as a menu or help screen item;

e) The amount won for the last completed game (until the next game starts or betting options are modified);

f) The player options selected (e.g., bet amount, lines played) for the last completed game (Until the next game starts or a new selection is made);

g) The denomination being played clearly displayed; and

h) It is recommended that a disclaimer regarding "Malfunction Voids all Pays" (or some equivalent verbiage) be clearly displayed. Should this disclaimer be used, it is required that the information be permanently affixed to the exterior of the machine and not removable.

3.2.3 Multi-Line Games

The following requirements shall apply to multi-line games:

a) Each individual line to be played shall be clearly indicated by the electronic gaming machine so that the player is in no doubt as to which lines are being bet on (displaying the number of lines bet shall be sufficient to meet this requirement);

b) The credits bet per line shall be shown (it is acceptable if the bet per line can be calculated from the number of lines bet and the total bet); and

c) The winning payline(s) shall be clearly discernable to the player (e.g., on a video game it may be accomplished by drawing a line over the symbols on the payline(s) and/or the flashing of winning symbols and line selection box). Where there are wins on multiple lines, each winning payline may be indicated in turn. (This would not apply to electromechanical reel games unless technology is used which implements paylines similar to those used on video displays, e.g. backlit reels flashing for each winning payline).

3.2.4 Game Cycle

A game is considered complete when the final transfer to the player's credit meter takes place or when all credits wagered are lost. The following are all considered to be part of a single game:

a) Games that trigger a free game feature and any subsequent free games;

b) "Second screen" bonus feature(s);

c) Games with player choice (e.g., Draw Poker or Blackjack);

d) Games where the rules permit wagering of additional credits (e.g., Blackjack insurance or the second part of a two-part Keno game);

e) Double-up/Gamble features; and

f) Games that trigger progressive jackpots.

3.3 Random Number Generator (RNG) Requirements

3.3.1 Game Selection Process

a) **All Combinations and Outcomes Shall Be Available**

Each possible permutation or combination of game elements that produces winning or losing game outcomes shall be available for random selection at the initiation of each play, unless otherwise denoted by the game;

b) **No Near Miss**

After selection of the game outcome, the electronic gaming machine shall not make a variable secondary decision, which affects the result shown to the player. For instance, the random number generator chooses an outcome that the game will be a loser. The game shall not substitute a particular type of loser to show to the player. This would eliminate the possibility of simulating a 'Near Miss' scenario where the odds of the top award symbol landing on the payline are limited but frequently appear above or below the payline;

c) **No Corruption from Associated Equipment**

An electronic gaming machine shall use appropriate protocols to protect the random number generator and random selection process from influence by associated equipment, which may be communicating with the electronic gaming machine.

3.3.2 Random Number Generator Requirements

The use of an RNG results in the selection of game symbols or production of game outcomes. The selection shall:

a) Be statistically independent;

b) Conform to the desired random distribution;

c) Pass various recognized statistical tests; and

d) Be unpredictable.

3.3.3 Applied Tests

The test laboratory may employ the use of various recognized tests to determine whether or not the random values produced by the random number generator pass the desired confidence level of 99%. These tests may include, but are not limited to:

a) Chi-square test;
b) Equi-distribution (frequency) test;
c) Gap test;
d) Overlaps test;
e) Poker test;
f) Coupon collector's test;
g) Permutation test;

h) Kolmogorov-Smirnov test;

i) Adjacency criterion tests;

j) Order statistic test;

k) Runs tests (patterns of occurrences should not be recurrent);

l) Interplay correlation test;

m) Serial correlation test potency and degree of serial correlation (outcomes should be independent of the previous game);

n) Tests on subsequences; and

o) Poisson distribution

NOTE: The independent test lab will choose the appropriate tests on a case-by-case basis depending on the RNG under review.

3.3.4 Background RNG Activity Requirement

The RNG shall be cycled continuously in the background between games and during game play at a speed that cannot be timed by the player. The test laboratory recognizes that some time during the game, the RNG may not be cycled when interrupts may be suspended. The test laboratory recognizes this but shall find that this exception shall be kept to a minimum.

3.3.5 RNG Seeding

The first seed shall be randomly determined by an uncontrolled event. After every game there shall be a random change in the RNG process (new seed, random timer, delay, etc.). This will verify the RNG doesn't start at the same value, every time. Alternatively, it is permissible not to use a random seed; however, the manufacturer must ensure that games will not synchronize. The method of seed generation shall ensure that:

a. The same sequence of random numbers is never used in more than one gaming machine at the same time;

b. The "next" game outcome is not predictable; and

c. The seeding and re-seeding shall be randomly determined and shall not be under operator control.

3.3.6 Live Game Correlation

Unless otherwise denoted on the payglass, where the electronic gaming machine plays a game that is recognizable to be a simulation of a live casino game such as Poker, Blackjack, Roulette, etc., the same probabilities associated with the live game shall be evident in the simulated game. For example, the odds of getting any particular number in Roulette where there is a single zero (0) and a double zero (00) on the wheel, shall be 1 in 38; the odds of drawing a specific card or cards in Poker shall be the same as in the live game.

3.3.7 Symbol Probability

For other game types (such as spinning reel games or video spinning reel games), the mathematical probability of a symbol appearing in a position for any game shall be constant, unless otherwise denoted on the payglass.

3.3.8 Card Games

The requirements for games depicting cards being drawn from a deck are the following:

a) At the start of each game/hand, the cards shall be drawn fairly from a randomly-shuffled deck; the replacement cards shall not be drawn until needed, and in accordance with game rules, to allow for multi-deck and depleting decks;

b) Cards once removed from the deck shall not be returned to the deck except as provided by the rules of the game depicted; and

c) As cards are removed from the deck they shall be immediately used as directed by the rules of the game (i.e., the cards are not to be discarded due to adaptive behavior by the electronic gaming machine).

NOTE: It is acceptable to draw **random numbers** for replacement cards at the time of the first hand random number draw, provided the replacement cards are sequentially used as needed.

3.3.9 Ball Drawing Games

The requirements for games depicting balls being drawn from a pool (e.g., Keno) are as follows:

a) At the start of each game, only balls applicable to the game are to be depicted. For games with bonus features and additional balls that are selected, they should be chosen from the original selection without duplicating an already chosen ball;

b) The pool shall not be re-mixed except as provided by the rules of the game depicted; and

c) As balls are drawn from the pool, they shall be immediately used as directed by the rules of the game (i.e., the balls are not to be discarded due to adaptive behavior by the electronic gaming machine).

3.3.10 Scaling Algorithms

a) If a random number with a range shorter than that provided by the RNG is required for some purpose within the electronic gaming machine, the method of re-scaling, (i.e., converting the number to the lower range), is to be designed in such a way that all numbers within the lower range are equally probable.

b) If a particular random number selected is outside the range of equal distribution of re-scaling values, it is permissible to discard that random number and select the next in sequence for the purpose of re-scaling.

3.3.11 Mechanical Based RNG Games

Mechanical-based RNG games are games that employ the laws of physics in any way to generate the outcome of the game. All mechanical-based RNG games must meet the requirements of this document with the exception of Sections 3.3.4, 3.3.5, and 3.3.10 that dictate the requirements for electronic random number generators. In addition, mechanical-based RNG games must meet the following rules:

a) The test laboratory will test multiple iterations to gather enough data to verify the randomness. In addition, the manufacturer may supply live data to assist in this evaluation;

b) The mechanical pieces must be constructed of materials to prevent decomposition of any component over time (e.g., a ball shall not disintegrate);

c) The properties of physical items used to choose the selection shall not be altered; and

d) The player shall not have the ability to physically interact or come into physical contact or manipulate the machine physically with the mechanical portion of the game.

NOTE: The laboratory reserves the right to require replacement parts after a pre-determined amount of time for the game to comply with Rule 3.3.11(b) above. In addition, the device(s) may require periodic inspections to ensure the integrity of the device. Each mechanical based RNG game shall be reviewed on a case-by-case basis.

3.4 Payout Percentages, Odds and Non-Cash Awards

3.4.1 Software Requirements for Percentage Payout

Each game shall theoretically payout a minimum of seventy five (75%) and a maximum of ninety eight percent (98%) during the expected lifetime of the game (i.e., progressives, bonus systems, merchandise, etc. shall not be included in the percentage payout if they are external to the game).

NOTE: The laboratory will provide the minimum and maximum theoretical payout percentage for the game within the certification report, unless otherwise noted. Additional external awards added to a game will require a re-evaluation of the theoretical payout percentage, considering the value of the award and possibly other factors. The laboratory will re-evaluate a game's theoretical payout percentage if/when requested.

a) **Optimum Play Used for Skill Games.** Electronic gaming machines that may be affected by player skill shall meet the requirement of this section when using a method of play that will provide the greatest return to the player over a period of continuous play.

b) **Minimum and Maximum Percentage Requirements Met at All Times.** The minimum and maximum percentage requirements of 75% and 98% respectively, shall be met at all times. The minimum percentage requirement shall be met when playing at the lowest end of a non-linear paytable (i.e., if a game is continuously played at a minimum bet level for the cycle of the game and the theoretical RTP is lower than the minimum percentage, then the paytable is not permissible). This example also extends to games such as Keno, whereby the continuous playing of any spot combination results in a theoretical return to player lower than the minimum percentage.

c) **Double-up or Gamble.** The double-up or gamble options shall have a theoretical return to the player of one hundred percent (100%).

3.4.2 Multiple Percentages

For games that offer multiple percentages, please refer to the 'Configuration Settings' requirements in Section 2.13.4 of this document.

3.4.3 Odds

The highest single advertised payout on each electronic gaming machine shall occur, statistically, at least **once in 100,000,000 games**. This does not apply to multiple awards won together on the same game play where the aggregate prize is not advertised. This odds rule shall not apply to games which make it possible for a player to win the highest win, multiple times through the use of free games. This rule does apply to each wager that wins the maximum award. If the highest advertised

award can occur within a bonus or free game feature, the odds calculation shall include the odds of obtaining the bonus round including the odds to achieve the top award.

3.4.4 Merchandise Prizes in Lieu of Cash Awards

Limitations (annuities – lump sum or the payment plan) on the prize amount of merchandise shall be clearly explained to the player on the game that is offering such a prize.

3.5 Bonus Games

3.5.1 Bonus Games

Games that have awards calculated that occur from game play within the base game's cycle (e.g. bonus features, including free games) shall meet the following:

a) The game shall display clearly to the player which game rules apply to the current game state. These rules shall be made available to the player prior to the start of the bonus game versus during the bonus game;

b) The game shall clearly display to the player possible win amount ranges, multiplier ranges, etc. that can be obtained from bonus play;

c) A game which offers a bonus game, other than those that occur randomly, shall display to the player sufficient information to indicate the current status towards the triggering of the next bonus game;

d) If the game requires obtaining several events/symbols toward a feature, the number of events/symbols needed to trigger the bonus shall be indicated along with the number of events/symbols collected at any point;

e) The game shall not adjust the likelihood of a bonus occurring, based on the history of prizes obtained in previous games (i.e., games shall not adapt their theoretical return to the player based on past payouts);

f) If a game's bonus is triggered after accruing a certain number of events/symbols or combination of events/symbols of a different kind over multiple games, the probability of obtaining like events/symbols shall not deteriorate as the game progresses (e.g., for identical events/symbols it is not permitted that the last few events/symbols needed are more difficult to obtain than the previous events/symbols of that kind);

g) The game shall make it clear to the player that they are in this mode to avoid the possibility of the player walking away from the electronic gaming machine not knowing the game is in a bonus mode;

h) Bonus game awards are part of the game cycle with predetermined award values. Bonus play award contributions to the program payout percentage are calculated consistent with awards of the regular game cycle. Specifically, if the cycle for bonus play awards is different from the base game cycle, then the bonus play awards, occurring within the base game's cycle, will be calculated as part of the game's payout; and

i) The game shall display the rules of play for the bonus game awards, the rewards associated with each bonus play award, and the character combinations that will result in the specific payouts. For bonus play awards achieved by obtaining specific game results, the progress of the award shall be displayed.

3.5.2 Player Selection or Interaction in Bonus Games

All electronic gaming machines that offer a bonus game or extended feature which requires player selection or interaction are prohibited from automatically making selections or initiating games or features unless the electronic gaming machine meets the requirements listed immediately below and explains the mechanism for auto-initiation or selection on the device glass or video display.

a) The patron is presented with a choice and specifically acknowledges his intent to have the electronic gaming machine auto-initiate the bonus or extended play feature by means of a button press or other physical/machine interaction. An audible and/or visual distinguishable warning shall be provided for at least five seconds, before the gaming machine makes any selections, or initiates any games or play features automatically.

b) The bonus or extended feature provides only one choice to the patron i.e., press button to spin wheel. In this case, the device may auto-initiate the bonus or extended feature after a time out period of at least two (2) minutes.

c) The bonus of extended feature is offered as part of community play that involves two or more patrons and where the delay of an offered selection or game initiation will directly impact the ability for other patrons to continue their bonus or extended feature. Prior to automatically making selections or initiating a community based bonus or feature the patron must be made aware of the time remaining in which they must make their selection or initiate play.

3.6 Extra Credits Wagered during Bonus Games

3.6.1 General Statement

If a bonus or feature game requires extra credits to be wagered during the bonus and the game accumulates all winnings (from the trigger and the feature) to a temporary "win" meter (rather than directly to the credit meter), the game shall:

a) Provide a means where winnings on the temporary meter can be bet (via the credit meter) to allow for instances where the player has an insufficient credit meter balance to complete the feature;

b) Transfer all credits on the temporary meter to the credit meter upon completion of the feature;

c) Not exceed the max bet limit, if one is set; and

d) Provide the player an opportunity NOT to participate.

3.7 Mystery Awards

3.7.1 General Statement

It is acceptable for games to offer a “mystery award” (an award that is not tied to any specific symbol combination) however, the game must indicate the maximum amount the player could potentially win. If the minimum amount that could potentially be awarded is not displayed, it will be assumed to be ‘0’. In addition, both a minimum and maximum amount must be displayed for any mystery award if the method to receive the award involves strategy or skill. This would include methods where the value of the paytable is used in order to make decisions that could increase the return to the player (e.g., video poker).

3.8 Multiple Games on the Electronic gaming machine

3.8.1 General Statement

A multi-game is defined as a game which can simultaneously be configured for use with multiple themes and/or multiple pay tables.

3.8.2 Selection of Game for Display

a) The methodology employed by a player to select a particular game for play on a multigame electronic gaming machine shall be clearly explained to the player on the electronic gaming machine, and be easily followed.

b) The electronic gaming machine shall be able to clearly inform the player of all games, their rules and/or the paytables, before the player must commit to playing them.

c) The player shall at all times be made aware of which game theme has been selected for play and is being played, as applicable.

d) When multiple game themes are offered for play, the player shall not be forced to play a game by just selecting a game title, unless the game screen clearly indicates the game selection is unchangeable. If not disclosed, the player shall be able to return to the main menu.

e) It should not be possible to select or start a new game before the current play is completed and all relevant meters have been updated, including features, gamble and other options of the game, unless the action to start a new game terminates the current play in an orderly manner.

f) The set of games or the paytable(s) offered to the player for selection can be changed only by a secure certified method which includes turning on and off games available for play. The rules outlined in 'Configuration Setting' of this document shall govern the NV memory clear control requirements for these types of selections. However, for games that keep the previous paytable's (the paytable just turned off) data in memory, an NV memory clear is not required.

g) No changes to the set of games or to the paytable(s) offered to the player for selection are permitted while there are credits on the player's credit meter or while a game is in progress, notwithstanding specific protocol features which allow such changes to be made in a controlled fashion.

3.9 Electronic Metering within the Electronic gaming machine

3.9.1 Credit Meter Units and Display

The credit meter shall be maintained in credits or cash value (i.e. applicable local currency) and shall at all times indicate all credits or cash available for the player to wager or cashout with the exception of when the player is viewing an informational screen such as a menu or help screen item. This should be displayed to the player unless a tilt condition or malfunction exists.

3.9.2 Tokenization

If the current local currency amount is not an even multiple of the tokenization factor for a game or the credit amount has a fractional value, the credits displayed for that game may be displayed and played as a truncated amount, (i.e., fractional part removed). However, the fractional credit amount shall be made available to the player when the truncated credit balance is zero. The fractional amount is also known as 'Residual Credit,' see also, 'Tokenization–Residual Credits,' Section 3.10.

3.9.3 Credit Meter – Incrementing

The value of every prize at the end of a game shall be added to the player's credit meter, except for handpays or merchandise, see also 'Merchandise Prizes In Lieu Of

Cash Awards,' Section 3.4.4. The value of all prize(s) awarded shall be added to the player's credit meter, except for handpays or merchandise.

3.9.4 Progressives

Progressive awards may be added to the credit meter if either:

a) The credit meter is maintained in the local currency amount format; or

b) The progressive meter is incremented to whole credit amounts; or

c) The progressive prize in local currency amount format is converted properly to credits upon transfer to the player's credit meter in a manner that does not mislead the player (i.e., make unqualified statement "wins meter amount" and then rounds down on conversion or cause accounting imbalances).

3.9.5 Collect Meter

There shall be a collect meter, which will show the number of credits or cash, collected by the player upon a cashout**.** This should be displayed to the player unless a tilt condition or malfunction exists. The number of credits or cash collected shall be subtracted from the player's credit meter and added to the collect meter. This meter may include handpays.

3.9.6 Software Meter Information Access

The software meter information shall only be accessible by an authorized person and must have the ability to be displayed on demand using a secure means.

3.9.7 Electronic Accounting and Occurrence 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, or in dollars and cents. If the meter is being used in Pesos and cents format, eight (8) digits must be used for the Peso amount and two (2) digits used for the cents amount. Devices configured for multi-denomination play shall display the units in Pesos and cents. The meter must roll over to zero upon the next occurrence, any time the meter exceeds ten (10) digits and after 9,999,999,999 has been reached or any other value that is logical. 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. All electronic gaming machines shall be equipped with a device, mechanism or method for retaining the value of all meter information specified in this Section (3.9) which must be preserved in the event of power loss to the electronic gaming machine. The required electronic meters are as follows (accounting meters are designated with an asterisk '*'):

a) **Coin In*.** The electronic gaming machine must have a meter that accumulates the total value of all wagers, whether the wagered amount results from the insertion of coins, tokens, currency deduction from a credit meter or any other means. This meter shall:

- Not include subsequent wagers of intermediate winnings accumulated during game play sequence such as those acquired from “double up” games;

- For all games, provide the coin in information, on a per paytable basis, to calculate a weighted average theoretical payback percentage.; and
- For paytables with a difference in theoretical payback percentage which exceeds 4 percent between wager categories, it is recommended that the device maintain and display coin in meters and the associated theoretical payback percentage, for each wager category with a different theoretical payback percentage, and calculate a weighted average theoretical payback percentage for that paytable.

NOTE: Wager categories, as defined above, do not apply to Keno or Skill Games.

b) **Coin Out*.** The electronic gaming machine must have a meter that accumulates the total value of all amounts directly paid by the device as a result of winning wagers, whether the payout is made from the hopper, to a credit meter or by any other means. This meter will not record amounts awarded as the result of an external bonusing system or a progressive payout;

c) **Coin Drop*.** The electronic gaming machine must have a meter that accumulates the total value of coins or tokens diverted to the drop;

d) **Attendant Paid Jackpots*.** The electronic gaming machine must have a meter that accumulates the total value of credits paid by an attendant resulting from a single game cycle, the amount of which is not capable of being paid by the electronic gaming machine itself. This does not include progressive amounts or amounts awarded as a result of an external bonusing system. This meter is only to include awards resulting from specifically identified amounts listed in the manufacturer’s par sheet. Jackpots which are keyed to the credit meter shall NOT increment this meter;

e) **Attendant Paid Cancelled Credits*.** The electronic gaming machine must have a meter that accumulates the total value paid by an attendant resulting from a player initiated cash-out that exceeds the physical or configured capability of the device to make the proper payout amount;

f) **Physical Coin In*.** The electronic gaming machine must have a meter that accumulates the total value of coins or tokens inserted into the device;

g) **Physical Coin Out*.** The electronic gaming machine must have a meter that accumulates the value of all coins or tokens physically paid by the dev**ice;**

h) **Bill In*. The** electronic gaming machine must have a meter that accumulates the total value of currency accepted. Additionally, the electronic gaming machine must have a specific occurrence meter for each denomination of currency accepted that records the number of bills accepted of each denomination;

i) **Ticket and/or Voucher In*.** The electronic gaming machine must have a meter that accumulates the total value of all electronic gaming machine vouchers accepted by the device; (A.K.A. Ticket-in);

j) **Ticket and/or Voucher Out*.** The electronic gaming machine must have a meter that accumulates the total value of all electronic gaming machine vouchers and payout receipts issued by the device; (A.K.A. Ticket-Out);

k) **Electronic Funds Transfer In* (EFT In).** The machine must have a meter "EFT In" that accumulates the total value of cashable credits electronically transferred from a financial institution to the electronic gaming machine through a cashless wagering system;

l) **Cashless Account Transfer In*** (A.K.A. WAT In-Wagering Account Transfer In). The electronic gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred to the electronic gaming machine from a wagering account by means of an external connection between the device and a cashless wagering system;

m) **Cashless Account Transfer Out*.** (A.K.A. WAT Out-Wagering Account Transfer Out) The electronic gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred from the electronic gaming machine to a wagering account by means of an external connection between the device and a cashless wagering system;

n) **Non-Cashable Electronic Promotion In*.** The electronic gaming machine must have a meter that accumulates the total value of non-cashable credits electronically transferred to the electronic gaming machine from a promotional account by means of an external connection between the device and a cashless wagering system;

o) **Cashable Electronic Promotion In*.** The electronic gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred to the electronic gaming machine from a promotional account by means of an external connection between the device and a cashless wagering system;

p) **Non-Cashable Electronic Promotion Out*.** The electronic gaming machine must have a meter that accumulates the total value of non-cashable credits electronically transferred from the electronic gaming machine to a promotional account by means of an external connection between the device and a cashless wagering system;

q) **Cashable Electronic Promotion Out*.** The electronic gaming machine must have a meter that accumulates the total value of cashable credits electronically transferred from the electronic gaming machine to a promotional account by means of an external connection between the device and a cashless wagering system;

r) **Cashable Promotional Credit Wagered.** If supported by function, the electronic gaming machine must have a meter that accumulates the total value of promotional cashable credits which are wagered. This includes credits that are transferred to the machine electronically or through the acceptance of coupon or voucher;

s) **Coupon Promotion In*.** The electronic gaming machine must have a meter that accumulates the total value of all electronic gaming machine promotional coupons accepted by the device;

t) **Coupon Promotion Out*.** The electronic gaming machine must have a meter that accumulates the total value of all electronic gaming machine promotional coupons issued by the device;

u) **Machine Paid External Bonus Payout*.** The electronic gaming machine must have a meter that accumulates the total value of additional amounts awarded as a result of an external bonusing system and paid by the device;

v) **Attendant Paid External Bonus Payout*.** The electronic gaming machine must have a meter that accumulates the total value of amounts awarded as a result of an external bonusing system paid by an attendant. Bonus payouts which are keyed to the credit meter, shall not increment this meter;

w) **Attendant Paid Progressive Payout*.** The electronic gaming machine must have a meter that accumulates the total value of credits paid by an attendant as a result of progressive awards that are not capable of being paid by the device itself. Progressive payouts which are keyed to the credit meter shall not increment this meter;

x) **Machine Paid Progressive Payout*.** The electronic gaming machine must have a meter that accumulates the total value of credits paid as a result of progressive awards paid directly by the device. This meter does not include awards paid as a result of an external bonusing system;

y) **Games Played.** The electronic gaming machine must have meters that accumulates the number of games played:

- Since power reset;
- Since external door close; and
- Since game initialization (NV memory clear);

z) **External Doors.** The machine must have meters that accumulates the number of times any external cabinet door that allows access to the locked logic area or currency compartment was opened since the last NV memory clear, provided power is supplied to the device.

aa) **Stacker Door.** The electronic gaming machine must have a meter that accumulates the number of times the stacker door has been opened since the last NV memory clear provided power is supplied to the device; and

bb) **Progressive Occurrence.** The electronic gaming machine must have a meter that accumulates the number of times each progressive meter is activated.
(The above rule shall be interpreted as requiring that the controller, whether the electronic gaming machine itself or an external progressive controller when configured for progressive functionality, shall provide for this occurrence a meter for each progressive level offered.)

3.9.8 Paytable Specific Meters

In addition to the one set of master electronic accounting meters required above, each individual game available for play shall have the paytable meters “Credits Bet” (i.e., Coin In) and “Credits Won” (i.e., Coin Out) in either credits or Philippine Peso. Even if a double up or gamble game is lost, the initial win amount, and credits bet amount, shall be recorded in the game-specific meters.

3.9.9 Double Up or Gamble Meters

For each type of double-up or gamble feature offered, there shall be sufficient meters to determine the feature’s actual return percentage, which shall increment accurately every time a double-up or gamble play concludes, including all amounts wagered and won during interim plays. These meters shall reflect amount wagered and amount won. If the electronic gaming machine does not supply accounting for the double-up or gamble information, the feature must provide for the ability to be disabled.

3.10 Tokenization – Residual Credits

3.10.1 General Statement

If residual credits exist, the manufacturer may provide a residual credit removal feature or any allowable cashout method to remove the residual credits or return the electronic gaming machine to normal game play (i.e., leave the residual credits on the player’s credit meter for betting). In addition:

a) Residual credits bet on the residual credit removal play shall be added to the Coin-In meter. Residual credits won as a result of the residual credit removal play shall be added to the Coin-Out meter;

b) If the residual credit removal play is won, the value of the win shall either:

- Increment the player's credit meter; or
- Be automatically dispensed, and the value of the coin(s) added to the Coin-Out meter;

c) All other appropriate electronic gaming machine meters shall be appropriately updated;

d) If the residual credit removal play is lost, all residual credits are to be removed from the credit meter;

e) If the residual credits are cashed out rather than wagered, the electronic gaming machine shall update the relevant meters (e.g., cancelled credit);

f) The residual credit removal play feature shall return at least seventy five (75%) to the player over the life of the game;

g) The player's current options and/or choices shall be clearly indicated electronically or by video display. These options shall not be misleading;

h) If the residual credit removal play offers the player a choice to complete the game (e.g., select a hidden card), the player shall be also given the option of exiting the residual credit removal mode and returning to the previous mode;

i) It shall not be possible to confuse the residual credit removal play with any other game feature (e.g., double-up or gamble);

j) If the residual credit removal play is offered on a multi-game electronic gaming machine, the play shall (for meter purposes of each individual game) either be considered to be a part of the game from which the play was invoked, or be treated as a separate game; and

k) The last game recall shall either display the residual credit removal play result or contain sufficient information (e.g., updated meters) to derive the result.

3.11 Communication Protocol

3.11.1 General Statement

For electronic gaming machines that are required to communicate with an online system, the device must accurately function as indicated by the communication

protocol that is implemented. External data communication protocols shall as far as possible be open standards based to allow for interoperability between gaming machines and the slot management systems.

3.11.2 Protection of Sensitive Information

The gaming machine must not allow any information contained in communication to or from the online monitoring 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 gaming machine. This includes, but is not limited to, validation information, secure PINs, credentials, or secure seeds and keys.

3.11.3 Communications

All external data communication shall be protocol based and/or incorporate an error detection and correction scheme to ensure an accuracy of ninety-nine percent (99%) or better of messages received. The communication protocol shall also ensure that erroneous data or signals would not adversely affect the operation of the gaming machine through the use of proven error checking mechanism on the transmission. The error checking mechanism used shall be at least Cyclic Redundancy Check (CRC) of 16 bits. Certificates, keys or seeds that are used for encryption purposes shall not be hard coded, and shall be changed periodically.

The gaming machine shall be able to synchronize its local date and time with the slot management systems intended for, within an accuracy of sixty (60) seconds so as to ensure that time stamping of all events and data is correct

3.12 Error Conditions

3.12.1 General Statement

Electronic gaming machines shall be capable of detecting and displaying the following error conditions and illuminate the tower light for each or sound an audible alarm. Error conditions shall cause the electronic gaming machine to lock up and require attendant intervention except as noted within this section. Error conditions shall be cleared either by an attendant or upon initiation of a new play sequence after the error has cleared except for those denoted by an “*” which will require further evaluation since deemed as a critical error. Error conditions shall be communicated to an on-line monitoring and control system, where applicable:

3.12.2 Door Open Error Conditions

a) All external doors (e.g., main, belly, top box);

b) Drop box door;

c) Stacker door; and

d) Any other currency storage areas that have a door.

3.12.3 Other Error Conditions

a) NV memory error* (for any critical memory);

b) Low NV memory battery for batteries external to the NV memory itself or low power source;

c) Program error or authentication mismatch*;

d) Reel spin errors. The specific reel number shall be identified in the error code. This should be detected under the following conditions:

- A mis-index condition for rotating reels, that affects the outcome of the game;
- In the final positioning of the reel, if the position error exceeds one-half of the width of the smallest symbol excluding blanks on the reel strip; and
- Microprocessor-controlled reels shall be monitored to detect malfunctions such as a reel which is jammed, or is not spinning freely, or any attempt to manipulate their final resting position.

3.12.4 Error Codes

For games that use error codes, a description of electronic gaming machine error codes and their meanings shall be affixed inside the electronic gaming machine unless the displayed codes are self-explanatory. This does not apply to video-based games; however, video-based games shall display meaningful text as to the error conditions.

3.13 Program Interruption & Resumption

3.13.1 Interruption

After a program interruption (e.g., processor reset), the software shall be able to recover to the state it was in immediately prior to the interruption occurring. It is acceptable for the game to return to a game completion state provided the game history and all credit and accounting meters comprehend a completed game.

On program interruption, the following procedures shall be implemented at the minimum:

a) The hopper shall be turned off;

b) The integrity of critical variables shall not be compromised by the interruption procedures; and

c) The power-down routine, if any, shall be fully completed

If a power failure occurs during acceptance of a bill or other note, the bill validator shall give proper credits or return the note, notwithstanding that there may be a small window of time where power may fail and credit may not be given. In this case, the window shall be less than one (1) second.

3.13.2. Restoring Power

If a electronic gaming machine is powered down while in an error condition, then upon restoring power, the specific error message shall still be displayed and the electronic gaming machine shall remain locked-up. This is unless power down is used as part of the error reset procedure, or if on power up or door closure, the electronic gaming machine checks for the error condition and detects that the error is no longer in existence.

3.13.3 Simultaneous Inputs

The program shall not be adversely affected by the simultaneous or sequential activation of the various inputs and outputs, such as 'play buttons', which might, whether intentionally or not, cause malfunctions or invalid results.

3.13.4 Resumption

On program resumption, the following procedures shall be performed at the minimum:

a. Any communications to an external device shall not begin until the program resumption routine, including self-tests, is completed successfully;

b. Gaming machine control programs shall test themselves for possible corruption due to failure of the program storage media using a robust and proven mechanism. In the event of a selftest failure for bill validators, the bill validator shall automatically disable itself (i.e., enter bill reject state) until the error state has been cleared.

c. The integrity of all critical memory shall be checked;

d. The power down process, if any, shall be tested for correct completion, and an appropriate message shall be displayed if incorrect completion is detected; and

e. The software shall be able to detect any change in the gaming machine program from when the gaming machine was last powered down or interrupted. If a change is detected, the gaming machine shall lock-up, display an appropriate error message until the gaming machine is reset by an authorized person.

3.13.5 Microprocessor Controlled Reels

Microprocessor controlled reels (e.g., stepper motor reels) shall re-spin automatically to the last valid play-mode result when the play mode is re-entered, and the reel positions have been altered (e.g., the main door is closed, power is restored, audit mode is exited, or an error condition cleared).

3.14 Door Open/Close

3.14.1 Required Door Metering

The software shall be able to detect access to the following doors or secure areas provided power is supplied to the device:

a) Main door(s);

b) Logic area door(s);

c) Drop box door(s);

d) Bill acceptor doors (including stacker door);

e) Belly door(s);

f) Any other area housing a critical processor;

g) Any other currency storage area that has a door; and

h) Communication boards, if accessible without opening any of the above.

3.14.2 Door Open Procedures

When any one of the electronic gaming machine’s doors are opened, the game shall cease play, enter an error condition, display an appropriate error message, disable coin acceptance and bill acceptance, and either sound an alarm or illuminate the tower light or both.

When all of the electronic gaming machine’s doors are closed, the game shall return to its original state and display an appropriate error message, until the next game play.

3.15 Taxation Reporting Limits

3.15.1 General Statement

The game shall be capable of entering a lock up condition if any awards from a single game cycle are in excess of a limit that is required by a taxing jurisdiction. Notwithstanding the foregoing, it is permissible to provide a mechanism to accrue W2G eligible winnings to a separate meter. This meter must not provide for the ability to place wagers and when collected by the player must lockup as required by a taxing jurisdiction.

3.16 Test/Diagnostic Mode (Demo Mode)

3.16.1 General Statement

If the electronic gaming machine is in a test, diagnostic or demo mode, any test that incorporates credits entering or leaving the electronic gaming machine (e.g., a hopper test) shall be completed prior to resumption of normal operation. In addition, there shall not be any mode other than normal operation (ready for play) that increments any of the electronic meters. Any credits on the electronic gaming machine that were accrued during the test, diagnostic or demo mode shall be automatically cleared before the mode is exited. Specific meters are permissible for these types of modes provided the meters indicate as such.

3.16.2 Entry to Test/Diagnostics Mode

The opening of the main cabinet door of the electronic gaming machine may automatically place the electronic gaming machine in a service or test/diagnostic mode. Test/diagnostics mode may also be entered, via an appropriate instruction, from an attendant during an audit mode access. These modes should not be accessible to the player.

3.16.3 Exiting From Test/Diagnostic Mode

When exiting from test-diagnostic mode, the game shall return to the original state it was in when the test mode was entered.

3.16.4 Test Games

If the device is in a game test mode, the electronic gaming machine shall clearly indicate that it is in a test mode and is not available for normal play.

3.17 Game History Recall

3.17.1 Game Recall

a) For the Game Recall information held by the EGM, it must be possible to show to the player the results of the play(s) or the outcome of the games. The manner in which the information is provided must enable observers to clearly identify the game sequences and result(s) that occurred.

b) Information on at least the last ten (10) games is to be always retrievable on the operation of a suitable external key- switch, or another secure method that is not available to the player.

3.17.2 Last Play Information Required

Last play information shall provide all information required to fully reconstruct the last ten (10) games. All values shall be displayed; including, but not limited, to the following:

a) Reels in final resting position, card values, balls drawn or other form of game result

b) The total number of credits at the start of play (less credits bet);

c) The total number of credits at the end of play;

d) The total number of credits bet including number of lines played and credits per line;

e) The total number of credits won associated with the prize resulting from the last play or the value in Philippine Pesos and cents for progressive prizes;

f) The total number of credit added (separated into coins, bills and cashless) since the end of the previous play and through to the end of the last play;

g) The total number of credits collected (separated into coins, bills and cashless) since the end of the previous play and through to the end of the last play;

h) The total value of cancelled credits (in Philippine Pesos) since the end of the previous play and through to the end of the last play (credits added or collected after the last play will be recorded on the completion of the next play);

i) Any player choice involved in play outcome including lines selected, unit wagered, cards held, balls selected, etc.;

j) Results of Gamble, (includes Residual Credit Removal features); and

k) The value of all standard meters at the end of the last play. Specific meters that are not applicable, may be omitted.

Note: The above requirements are the default for Last Play Information in that event after the completion of the last play (such as inserting money to add credits, or collecting credits) do not form part of the Last Play requirements. However, it is permissible for manufacturers to display this information provided that what happened after the completion of the last play is clear.

This information can be represented in graphical or text format. If a progressive was awarded, it is sufficient to indicate the progressive was awarded and not display the value. This information should include the final game outcome, including all player choices and bonus features. In addition, include the results of double-up or gamble (if applicable).

3.17.3 Bonus Rounds

The ten (10) game recalls shall reflect bonus rounds in their entirety. If a bonus round lasts 'x number of events,' each with separate outcomes, each of the 'x events' shall be displayed with its corresponding outcome, regardless if the result is a win or loss. The recall shall also reflect position dependent events if the outcome results in an award. Electronic gaming machines offering games with a variable number of free games, per base game, may satisfy this requirement by providing the capability to display the last 50 free games in addition to each base game.

CHAPTER 4

4.0 TOURNAMENTS

4.1 Tournament Description

4.1.1 General Statement

A tournament is an organized event that permits a player to engage in competitive play against other players.

4.2 Tournament Program

4.2.1 General Statement

Each electronic gaming machine may be equipped with a certified program, which allows for tournament mode play. The tournament option shall default to disabled. If tournament is an option, it shall be enabled by a regulator-approved and controlled method requiring manual intervention and/or total replacement of the logic board with a certified tournament board.

4.3 Tournament - Hardware

4.3.1 General Statement

The game shall comply with the requirements set forth in Chapter 2 of this document, if applicable.

4.4 Tournament - Software

4.4.1 General Statement

No electronic gaming machine, while enabled for tournament play shall accept credits from any source, nor pay out credits in anyway, but shall utilize credit points only. Tournament credits shall have no cash value. These games shall not increment any mechanical or electro-mechanical meters unless they are meters designed exclusively for use with tournament software, and shall not communicate any tournament-related accounting information to the system. The percentage requirements as addressed in Section 3.4 are waived for tournament games.

4.4.2 Electronic gaming machine Settings

All electronic gaming machines used in a single tournament shall utilize the same electronics and machine settings as other electronic gaming machines involved in the tournament, including reel speed settings.