*Government Notice No. 119 of 2024*

## THE GAMBLING REGULATORY AUTHORITY ACT

### Regulations made by the Minister under section 164 of the Gambling Regulatory Authority Act

**1.** These regulations may be cited as the Gambling Regulatory Authority (Technical Standards for Gaming Machine, Limited Payout Machine, Amusement Machine and Server) Regulations 2024.

**2.** In these regulations –

"Act" means the Gambling Regulatory Authority Act;

"return to player" means the ratio of total winnings to the total turnover, expressed as a percentage;

"server" means a monitoring and control system which is used by a gaming machine operator to monitor and keep account of all the transactions of the gaming machines and kept on his premises.

**3.** For the purpose of section 22E of the Act, the technical standards of a hotel casino gaming machine shall be as set out in the First Schedule.

**4.** For the purpose of section 28(5) of the Act, the technical standards of a server shall be as set out in the Second Schedule.

**5.** For the purpose of section 28B(1) of the Act, the technical standards of a gaming machine shall be as set out in the First Schedule.

**6.** For the purpose of section 29C(4) of the Act, the technical standards of a limited payout machine shall be as set out in the Third Schedule.

**7.** For the purpose of section 29H(4) of the Act, the technical standards of an amusement machine shall be as set out in the Fourth Schedule.

**8.** The return to a player on –

    (a)   a gaming machine shall be at least 83 per cent;

    (b)   a limited payout machine shall be at least 81 per cent.

**9.** (1)   A gaming test laboratory shall –

    (a)   be approved by the Board; and

    (b)   issue test report in accordance with the standards set out in the First, Second, Third and Fourth Schedules.

(2)   Any server which was used by a gaming machine operator to monitor and keep account of the transactions of his gaming machines shall, not later than 3 years after the coming into operation of these regulations, be upgraded or replaced in accordance with the technical standards set out in the Second Schedule.

(3)   Any limited payout machine, in respect of which a limited payout machine licence has been issued shall, not later than 3 years after the coming into operation of these regulations, be upgraded or replaced in accordance with the technical standards set out in the Third Schedule.

(4)   Any amusement machine, in respect of which an amusement machine licence has been issued shall, not later than 3 years after the coming into operation of these regulations, be upgraded or be replaced in accordance with the technical standards set out in the Fourth Schedule.

**10.** Any person who –

    (a)    operates a gaming machine, a limited payout machine, an amusement machine or a server; or

    (b)    causes a gaming machine, a limited payout machine, an amusement machine or a server to be operated,

in contravention of these regulations shall commit an offence and shall, on conviction, be liable to a fine not exceeding 500,000 rupees and to imprisonment for a term not exceeding 5 years.

**11.** The Gambling Regulatory Authority (Limited Payout Machine) (Technical Standards) Regulations 2014 are revoked.

**12.** These regulations shall come into operation on 1 August 2024.

Made by the Minister on 4 July 2024.

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## FIRST SCHEDULE
[Regulations 3, 5, 9(1) and 9(2)]

Technical Standards for Hotel Casino Gaming
Machine and Gaming Machine
(Ref: GRA/TS-GM/2024)

### Introduction

These technical standards are supplementary to and are not intended to derogate from any provisions in the Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations. In the event of any inconsistency, the provisions in Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations shall apply

The intention of this part of GRA/TS-GM/2024 is to place sufficient controls on software and operations to ensure that wagering is fair, safe, secure, reliable and auditable.

It is not the intention of this part of GRA/TS-GM/2024 to unreasonably
a) mandate a single solution or method of realizing an objective,
b) limit technology application of software,
c) limit creativity and variety of choice,
d) limit marketability, or
e) advantage any supplier or manufacturer of software.

Alternative implementations to the requirements contained in this part of GRA/TS-GM/2024 will be

considered on a case-by-case basis by the GRA.

Situations or considerations that arise from evaluation of systems, which have not been addressed in this document (for example, owing to omissions or the use of new technology), will be resolved at the sole discretion of the GRA.

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### Scope

This part of GRA/TS-GM/2024 specifies the constructional and operational requirements for machines (machines) that reside on, or are operated on (or both), the gambling floor of a casino.

Equipment covered by the requirements of this part of GRA/TS-GM/2024 includes:
a) machines,
b) jackpot controllers, and
c) machine consoles.
d) Roulettes
e) Server Based Gaming System

### General notes

*NOTE 1 If the Machine is attached to a local monitoring and control system (LMCS) it shall be ensured the system is approved by the GRA and meets the requirements laid down in GRA/TS-LMCS/2024.*

*NOTE 2 If the machine is not connected to a LMCS still needs to be evaluated in terms of machine reporting/messaging capabilities and those cases where the reporting/messaging requirements described in this regulation are not met will be reviewed in a case by case basis and may be authorized at the sole discretion of the GRA.*

*NOTE 3 for the purpose of this standard, "machine" refers to machines, limited payout machines or any machine used for gambling activities that is required by legislation to be connected to a local monitoring and control system.*

### Definitions and abbreviations

For the purposes of this document, the following definitions and abbreviations apply.

### Definitions

### 3.1.1
**attract mode**
information or graphics that relate to the game or games available on that machine that the machine may display during the machine's idle mode

### 3.1.2
**autoplay**
facility in a machine that automatically plays the next game following the completion of the current game

### 3.1.3
**banknote acceptor**
bill acceptor bill validator note acceptor
device that is fitted with photo-optic and other sensors (internal or external to the device) and that is used to accept and validate paper or plastic legal tender or coupons approved in that jurisdiction

*NOTE Where reference is made to a "Bill acceptor system", this is intended to include all bill handling components, whereas "Bill validator system" refers to the validator unit and its sub-components, excluding other parts of the handling system.*

### 3.1.4
**bet**
means:
a) stake, or stake on behalf of another person; or
b) expressly or impliedly, undertake, promise or agree to stake on behalf of another person, any money or money's worth on any event or contingency;

### 3.1.5
**capping**
**truncating**

situation where the amount added to the win meter from a single play within a game is less than either

the monetary or credit value for the winning combination, or

the sum of the monetary value or sum of the credit values for the winning combinations, from a single play within a game that is displayed to the player on the paytable

### 3.1.6
**cash**

a) means money, in notes or coins, of Mauritius or in any other currency; and

b) includes any cheque which is neither crossed nor made payable to order, whether in Mauritius currency or in any other currency;

### 3.1.7
**cashout**

action initiated by a player when redeeming available credits from a machine

*NOTE This term is used whether the machine pays credits from the hopper, by electronic transaction or by issuing a ticket.*

### 3.1.8
**coin dispensing device dump**

hopper dump

hopper count

function in the machine whereby the entire contents of CDD are counted out into the coin tray without affecting the GRA revenue calculation

### 3.1.9
**coin acceptance device**

coin input devices, together with the coin validator or comparator, photo-optic sensors (internal or external to the comparator), and any additional devices used to accept and validate a coin

**3.1.10**
**coin acceptance system**
system that comprises the coin acceptance device and the associated software required to validate the physical input of coins and the conversion of these coins into credits

**3.1.11**
**coin dispensing device**
device, together with coin storage mechanism (for example, hopper or tubes), photo-optic and other sensors (internal or external to the device) and any other devices and pathways used to pay out coins to the player

**3.1.12**
**critical data**
data contained in critical memory as follows:
a) all metering required by this part of GRA/TS-GM/2024;
b) machine or game configuration data (or both);
c) information that pertains to the last five games (including the current game, if incomplete);
d) software state (the last normal state the machine software was in before interruption);
e) current credits; and
f) information regarding any significant events.

*NOTE   Information pertaining to the last five games is only required if applicable to that type of machine.*

**3.1.13**
**critical memory**
memory locations for storing critical data

**3.1.14**
**electronic funds transfer**
advanced funds transfer
system whereby credits are transferred to or from a machine by any

means other than coins or tokens

### 3.1.15
**error event**
set of operational conditions for a machine that constitutes a deviation from the normal conditions or the conditions specified during a game, during idle mode or during data interchange with another machine

### 3.1.16
**equipment**
any hardware, software, firmware, flashware or any combination in whole or in part of these intended for use in gambling

### 3.1.17
**feature**
activity within a game triggered by an outcome within that game

*NOTE Any additional free game, free spin of certain reels, or secondary choice necessary to complete a   game is considered a feature.*

### 3.1.18
**formal application configuration**
document listing the approved software and parameters for a server-based gambling system and its components by the manufacturer or supplier

### 3.1.19
**gamble feature**
feature within a game that is only entered following a win, and which involves the risking of all or part of the result of that win

*NOTE Gamble feature bets may incorporate a variety of symbols, player choices, or win chances.*

**3.1.20**
**gambling**
a)      means paying or staking consideration, directly or indirectly, on the outcome of something with a view to winning money when the outcome depends wholly or partly on chance; and
b)      includes:
  i. playing any casino game, gaming house game or on any machine or limited payout machine;
  ii. pool betting; and
  iii. betting, paying, or staking consideration on the outcome of any event or contingency;

**3.1.21**
**game**
combination of events, including player interaction with the machine, that determine what prize may eventually be won from an amount staked or bet by the player

*NOTE 1 Definitions of "game" in legislation take precedence over this definition.*

*NOTE 2 The game commences when the player makes a bet from the player's credit meter that is not part of any previous game, or inserts one or more coins or any form of wager and game play is initiated.*

*NOTE 3 The game is considered completed when the player cannot continue play activity without committing additional credits from the credit meter or CAD, and has no credits at risk.*

*NOTE 4 The following elements are all considered to form part of a single game, in other words, the game is not considered to have been completed until no more elements are available for play:*
*a)      games that trigger a free game feature and any subsequent free games;*
*b)      features occurring or triggered in a single game;*
*c)      "second screen" bonus feature(s);*
*d)      games with player choice (for example, draw poker or*

*blackjack);*

*e)      games where the rules permit wagering of additional credits, for example, blackjack insurance or the second part of a two-part keno game; and*

*f)      gamble feature (for example, double-up).*

*NOTE 5 The game is not considered to be completed until all the appropriate meters for the game have been updated.*

**3.1.22**
**machine**
a) means an electro-mechanical or other device which, on insertion of a coin, bank note, electronic credit, token or similar object or on payment of any other consideration, is available to be played or operated and the playing or operation of which, by reason of the skill of the player or operator or through an element of chance or both, may deliver, or entitle the person playing or operating the machine, or any other person, to receive cash, cheques, credit, electronic credits, debits, tokens, tickets or prizes; and
b) includes a machine:
   i. which produces a random combination of symbols on reels; or
  ii. on which a player is able to play roulette, bingo, 21, blackjack, chemin de fer, baccarat, poker, Chinese roulette, keno or on horse racing or games of similar type,
 iii. but does not include an amusement machine or limited payout machine;

**3.1.23**
**Local server**
computer(s) of a local monitoring and control system on which the software is loaded

**3.1.24**
**idle mode**
state in which a machine is powered up, but is not active in the execution of a game, a test routine, an audit, a calibration, or a data interchange with an external device

**3.1.25**
**Inspector**
means a person employed as such by the Authority under section 14 (1) of the Gambling Regulatory Authority Act; and includes
    i.    any person authorised in writing by the Chief Executive under section 14(2) of the Gambling Regulatory Authority Act; and
  ii. the Director-General or any officer under the Mauritius Revenue Authority Act, authorised in writing by the Director-General to act as inspector

**3.1.26**
**jackpot**
award, in excess of the maximum prize as specified on a game's paytable, that is available to be won by a player as a result of activity on a machine

**3.1.27**
**legislation**
national legislation that deals with amusement, gambling, wagering, betting or horse-racing and any regulation or rule made in terms of such Act

**3.1.28**
**logic area**
secure enclosure area that houses electronic components that have the potential to influence the operation of the host, the data controller unit, the bank controller or the machine

**3.1.29**
**master reset**
intentional memory clear of the random access memory (RAM) and other volatile memory of a machine

**3.1.30**
**metamorphic feature**
metamorphic game

feature of a game or series of games that is not completely independent of play history

### 3.1.31
**memory**
locations within the machine for storing electronic data, and the data stored therein

### 3.1.32
**Local Monitoring and Control System**
local server, data controller unit, bank controller and communications interface to each machine and the connections between them located at such place designated by the operator.

### 3.1.33
**multigame**
more than one game type offered by the gambling software on a single machine

### 3.1.34
**mystery jackpot**
random win mystery win any money, merchandise, object of value or any other consideration whatsoever specified or otherwise by a license holder as a jackpot which may be paid to a patron when independently triggered as being so payable by an RNG

### 3.1.35
**paytable**
list of winning combinations with their associated win amounts, rules of the game and explanations as to how a winning combination may be made up that is, or is capable of being, displayed to the player

### 3.1.36
**period meter**
soft meter
meter implemented in software that is used in a similar way to the odometer (for example, "trip meter") on a car

*NOTE This meter is used to record meter values since a given event (for example, coins and bills in since the last clearance).*

### 3.1.37
**progressive jackpot**
additional variable award (additional to the game's paytable) available to be won by a player as a result of an event on a machine

*NOTE The progressive jackpot starts at the base value and is incremented by a nominated amount based on activity on the machine(s) connected to the progressive jackpot gambling equipment.*

### 3.1.38
**public**
persons or players who engage in gambling activities

### 3.1.39
**reprogrammable memory device**
type of on-chip memory storage device

### 3.1.40
**return to player**
ratio of total winnings to the total turnover, expressed as a percentage

### 3.1.41
**secure area**
area within a machine that may only be accessed by means of a key

### 3.1.42
**significant event**
set of operational conditions to be recorded by the local monitoring and control system for machines during a game, during idle mode or during data interchange with another machine

### 3.1.43
**Site data logger**

on-site or intermediate data collector for a local monitoring and control system

*NOTE Includes data collection units contained within, or as part of, machines.*

### 3.1.44
**software shell**
base software or the operating system software in which there is no game information

### 3.1.45
**stake**
total monetary value of all bets or wagers put at risk to play a single game

### 3.1.46
**stand-alone jackpot**
fixed or progressive award (additional to the game's paytable) available to be won by a player on a single machine as a result of an event on that machine

### 3.1.47
**static artwork**
artwork that is physically printed on, for example glass, plastics, and non-removable stickers, and that is displayed on the machine to the player

### 3.1.48
**Test laboratory**
laboratory whose test results are accepted by GRA

### 3.1.49
**token**
circular element with an indicated monetary value, excluding legal tender such as coins, that might be put into machines

### 3.1.50

**tokenization**

situation where the insertion of one coin either gives rise to more than one credit being made available to the player, or where more than one coin is required to be inserted in the CAD for the player to receive one credit

### 3.1.51
**turnover**

handle

monetary value of the total of all cash or credits (or both) staked on game play

### 3.1.52
**win**

award

prize

number of credits or monetary value awarded to the player as a result of a winning combination or combinations at the end of a single play within a game

### 3.1.53
**winning combination**

one or more winning patterns that result in credits being added to the total win meter, and the win display

### 3.1.54
**winning pattern**

set of symbols that participates in a winning combination (including substitution)

### 3.1.55
**winnings**

monetary value of the total of all coins or credits added to the total win meter and the win display during a game, as a result of any game outcome according to the game rules, resulting in credits being added to the total win meter and to the win display

*NOTE A machine might display this value in credits or in monetary value.*

### 3.1.56
**portable memory**
any peripheral memory device that will be removed from a gambling machine, for example, USB ″memory cards″, external hard disk drive, and flash cards

### 3.1.57
**central electronic monitoring system for machines**
Information System for the monitoring of machines in Mauritius. It consists of several components including the software, hardware, database and related services

### 3.1.58
**Interfacing component (and converter board)**
A component built into a machine that expands its functionalities. It converts legacy protocol of the machine to IGSA G2S. The Component may include a G2S Converter Board and/or Software. A converter board is always assigned to a machine.

### 3.1.59
**Client-Server system**
a client-server system can be fragmentally defined as either a server based game system or a server supported game system. Both of which can be defined as the combination of a server, machine (client) and all interface elements that function collectively for the purpose of linking the machine with the server to perform a myriad of functions related to gaming, which may include, but are not limited to:
a)      Downloading of Game Logic to the Client Terminals;
b)      Central Server Random Number Generation;
c)      Thin Client Gaming Configurations

### 3.1.60
**server based game system**
the combination of a server and machine(s) (client) in which the entire or integral portion of game content resides on the server. This system works

collectively in a fashion in which the machine will not be capable of functioning when disconnected from the system.

### 3.1.61
### Server Supported Game System

the combination of a server and machines(s) (client) which together allow the transfer of the entire control program and game content to the machine(s) for the purpose of downloading control programs and other software resources to the machine on an intermittent basis. The machines connected to the system are capable of operating independently from the system once the downloading process has been completed. This configuration encompasses cases where the system may take control of peripheral devices or associated equipment typically considered part of a conventional machine such as a printer. In a system supported game, game outcome is determined by the machines connected to the system and not by the system itself. The machine is capable of functioning if disconnected from the system.

**Abbreviations**

| | |
|---|---|
| AFT | advanced funds transfer |
| BCD | binary coded decimal |
| CAS | coin acceptance system |
| CD | compact disk |
| CDD | coin dispensing device |
| CEMS-Machines | Central Electronic Monitoring System for Gambling equipment |
| CPU | central processing unit |
| CSS | Client-Server System |
| DVD | digital video disk |
| EFT | electronic funds transfer |
| EMC | electromagnetic compatibility |
| EMI | electromagnetic interference |
| EPROM | erasable programmable read-only memory |
| ESD | Electro-Static Discharge |
| G2S | Game to System |
| Machine Operator | A company licensed to operate a machine |
| GRA | Mauritius Gambling Regulatory Authority |
| I/O | input/output |
| LAN | local area network |
| LMCS | Local monitoring and control system |
| MRA | Mauritius Revenue Authority |
| MUR | Mauritian rupees |
| MUT | Mauritius time |
| PCB | printed circuit board |
| PIN | personal identification |
| PLD | programmable logic device |
| RAM | random access memory |
| RFI | Radio Frequency Interference |
| RNG | random number generator |
| ROM | read-only memory |

| RTP | return to player |
| TL | test laboratory |
| WORM | write-once read-many |

## 4. General requirements

### 4.1 Terminal setup

**4.1.1** Each terminal or player station of a multi-terminal or multi-player machine shall be treated as one machine

**4.1.2** Bill validators may be allowed as per provisions in the Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007)

### 4.2 Documentation

**4.2.1** Each machine model shall have readily available and pertinent operating and service manuals.

**4.2.2** The operating manual shall accurately depict the use of the machine in its operating environment, and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable the relevant personnel to understand the manual with minimal guidance.

**4.2.3** The service manual shall accurately depict the machine that it is intended to cover, and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable a competent person to perform repair and maintenance in a way that is conducive to the long-term reliability of the machine.

**4.2.4** Software documentation shall include an edit history that provides details of all changes to code (what, why, who and when).

### 4.3 Enclosure construction

**4.3.1** The enclosure shall be of a sturdy construction with a locking system that resists the kind of unauthorized entry that the machine is likely to be subjected to in a gambling venue. The enclosure shall be so designed to protect internal components from any external abuse to which the machine is likely to be subjected in a gambling venue.

**4.3.2** Areas of the enclosure that are accessible to patrons and staff shall be so constructed and so finished as not to create a safety hazard or create a risk of injury.

**4.3.3** All protuberances (for example, buttons and handles) on the enclosure that are accessible to patrons or staff, and all attachments to the enclosure (for example, labels and identification plates) shall be sufficiently robust to prevent their unauthorized removal.

**4.3.4** Door support devices shall be of construction solid enough to prevent sagging of the door and any problems with door sensor alignment.

**4.3.5** Spilled liquid shall not be able to enter the logic area, the power supplies, or areas that contain wiring of voltage exceeding 32 V.

### 4.4 Enclosure identification

**4.4.1** The machine shall have an identification badge made of metal or any equally resilient material that bears the following information permanently affixed to the exterior of the enclosure by the manufacturer in a position that allows it to be read easily after the equipment has been installed:
a) the name of the manufacturer;
b) a unique serial number and
c) the date of manufacturer.
d) model number

**4.4.2** The serial number shall be marked or affixed in a permanent manner onto the interior of the machine enclosure in a position that allows it to be read easily after the equipment has been installed.
**4.4.3** Each external key switch of the gambling equipment enclosure, switches and player buttons shall be labelled, either according to its function or to the series of events initiated by its activation. If a key lock initiates some kind of user activity other than simply unlocking a door, then its function shall be labelled (for example, if a key lock turns one

way to enter audit mode, and turns the opposite way to enter cancel credit mode, then both directions shall be labelled accordingly).

## 4.5 Enclosure security

**4.5.1** All of a machine's components that do not form part of the player's input interface (for example, buttons) shall be stored within one or more secure areas of the machine. Unauthorized access to a secure area by physical means shall be detectable. This requirement does not apply to areas that only provide access to lighting components, such as top boxes or belly panels.

**4.5.2** Where holes, gaps or slots exist in the exterior of a secure area, there shall be sufficient protection to ensure that the insertion of foreign objects shall not compromise the security or safety of that secure area.

**4.5.3** A secure area shall resist forced entry and shall retain evidence of attempts at such entry.

Access to a locked area "A" shall not be possible from another locked area "B" without the use of a key or other secure access device for locked area "A".

## 4.6 Access detection systems

**4.6.1** All access points shall have access detection sensors.

**4.6.2** The door access detection system shall provide a signal to enable the local monitoring and control system to interpret whether access to a logic area has occurred, regardless of whether mains power is switched on or off, or whether the machine is on-line or off-line. It shall remain able to detect this event with the mains power off for at least 24 h. This event shall be reported once the mains power is restored, or when the machine is connected back online, whichever occurs first.

**4.6.3** When the door of the machine is shut, it shall not be possible to insert any object into the machine in such a way that the access detection sensor is disabled.

**4.6.4** The access detection system shall be secure against attempts to disable it or to interfere with its normal mode of operation. Cable runs

and mountings for the logic area access sensors shall be securely protected.

**4.6.5** It shall not be possible to create a false alarm door open condition (for example, by bumping the door).

**4.6.6** If the access detection system is disconnected, the gambling equipment shall interpret this action as the door having been opened.

**4.6.7** The machine shall deactivate game play upon the opening of a door but may immediately reactivate when the door is closed, unless it has noticed the changing of counters or insertion of coins while this door is open, which is deemed to be interference and precludes automatic reactivation unless the machine was placed in test mode. In such case a significant event message shall be sent and the local monitoring and control system shall add the staff card number to the event message. If no card number is available, the message shall be tagged by the local monitoring and control system as an unauthorized access.

## 4.7 Logic areas

**4.7.1** Items of electronic componentry that shall be housed in one or more logic areas are:

a) Central processing units (CPUs) and other electronic components involved in the operation and calculation of game play (for example, game controller electronics, and components housing the game or system firmware program storage media);

b) electronics involved in the operation and in the calculation of game results;

c) electronics involved in the calculation of game display, and components housing display program storage media (passive display equipment exempted);

d) communication controller electronics, and components housing the communication program storage media; and

e) all reprogrammable memory devices that affect the game play function of the machine.

**4.7.2** Communication, input/output (I/O) and display interfaces that do not significantly influence the behaviour of the machine may be excluded from the logic area.

**4.7.3** If the logic door is opened more than once while the machine is off-line or powered off, the machine shall, for the purposes of event reporting, treat this as a single entry.

**4.7.4** There shall be a facility for storing a logic door open event for at least 14 d.

**4.7.5** Provision shall be made on the logic door so that a physical seal can be fitted which would be broken if the logic area was accessed.

**4.7.6** It shall not be possible (without a detailed technical knowledge of the machine) to reset the logic area door open state (without detection) when the logic door is open (for example, the access detection system shall not be able to be tampered with or be replaced without leaving evidence that this has occurred).

**4.7.7** It shall not be possible to insert a device into the logic area that can disable the door open sensor of the logic area when the door is shut without such act being detected or leaving evidence of tampering.

**4.7.8** If the logic area consists of a board with no door as such, as the entire board can be removed and accessed, the security requirements for the logic doors extend to logic units (such as removal of the board is equivalent to opening the door).

**4.7.9** It shall not be possible to reset the logic area door open state, by either hardware or software means, if the logic door is still open.

**4.7.10** If the logic area is not located inside another secure area of the machine it shall possess a second means of physically securing the area by a lock in addition to the provision for fitting a seal.

**4.7.11** It shall not be possible to access the data bus, address bus, or control lines of any of the above-mentioned circuit boards without gaining access to a logic area.

## 5. Electrical requirements

### 5.1  General Requirements

All connectors and wires shall be easily identifiable, both in the machine itself and on the circuit diagrams in the manuals.

## 5.2 Electro-Magnetic Compatibility (EMC)

**5.2.1** Electrical and mechanical parts and design principals of the machine shall not subject a player to any physical hazards. The independent test laboratory does not make any findings with regard to Electro-Magnetic Compatibility (EMC) or Radio Frequency Interference (RFI), as that is the responsibility of the manufacturer of the machine, or those that purchase it. Such EMC and RFI testing may be required under separate statute, regulation, law, or act and should be researched accordingly by those parties who manufacture or purchase said machine. The independent test laboratory does not test for, is not liable for, nor makes any findings related to these matters. However, during the course of testing, the independent test laboratory shall inspect for marks, symbols or compliance reports indicating that a gaming device has undergone product safety or other similar compliance testing by some other party.

*Note: It is the manufacturer's responsibility to submit EMC and RFI reports to the TL. These reports shall be listed in the Test Report issued by the TL*

## 5.3 Electro-Static Discharge

**5.3.1** The independent test laboratory shall perform certain tests to determine whether or not an Electro-Static Discharge (ESD) impacts the integrity of a gaming device. ESD testing is intended to simulate techniques observed in the field that may be used in an attempt to disrupt the integrity of electronic gaming devices.
**5.3.2** The machine shall comply with the following requirements related to ESD testing:

a) The Random Number Generator (RNG) and random selection process shall be impervious to influences from ESD; and

b) Protection against ESD requires that the gaming device's conductive cabinet be earthed in such a way that static discharge energy shall not permanently damage or permanently impact the normal operation of the electronics or other components within the machine. machine's may exhibit temporary disruption when subjected to a significant external ESD with a severity level of 27kV air discharge. The machine shall exhibit a capacity to recover and complete any interrupted play without loss or corruption of any control information or critical data following any temporary disruption.

## 6. Computer and peripheral hardware requirements

### 6.1    Random access memory

**6.1.1** Machine RAM data storage shall be capable of reliably preserving its memory contents for at least 72 h with the mains power switched off. When the battery is at or below its 72 h capacity limit, the machine shall automatically generate a type 4 significant event message to the local monitoring and control system and disable itself. It shall not be possible to reset the machine until the battery capacity has increased above the 72-h capacity limit, either by recharging or replacement of the battery. If a rechargeable battery is used, the power source shall be capable of recharging the battery to its full capacity within 24 h.

*NOTE     General significant event messages such as "Tilt" are not acceptable.*

**6.1.2** RAM clears of the machine shall not be possible except by accessing the logic area.

**6.1.3** In a machine, batteries shall be secured and connected to the board(s) that contain RAM such that the batteries cannot be easily disconnected.

### 6.2     Critical memory requirements

**6.2.1** Manufacturers shall ensure that critical data are recorded in at least two physically separate and distinct hardware devices (which may be of the same type), either within the machine or the local data logger (or both). This critical data record shall be retained on these devices until such time that at least the following data have been successfully transmitted to the local monitoring and control system:

a) all auditing meters;

b) current credits;

c) machine or game configuration data (for example, machine address, denomination); and

d) significant event information.

**6.2.2** These devices shall be capable of being reliably updated at every critical memory change.

**6.2.3** Manufacturers shall ensure that portable memory devices are fixed within the secure logic area.

*NOTE   Manufacturers may use portable memory in a gambling device.*

**6.2.4** Portable memory shall be treated as random access memory (RAM).

## 6.3    Program memory storage requirement

**6.3.1** All read-only memories (ROMs) (for example, erasable programmable read-only memories (EPROMs), CD-ROMs and programmable logic devices (PLDs) shall be clearly marked to identify the software and the revision level of the information stored in the devices.

**6.3.2** All EPROMs (and PLDs that have erasure windows) shall be fitted with covers over their erasure windows.

**6.3.3** EPROMs that contain any settings or programs that have the potential to cause the machine to fail to comply with this part of MS or with legislation shall not be contained within the machine. This includes EPROMs that have a range of parameters that are used for setting up the device.

### 6.4    Programmable logic elements

All programmable logic elements that incorporate read-inhibit fuses shall be programmed to prevent unauthorized reading or copying of these elements.

### 6.5    Circuit boards
Patch wires and track cuts may be present but shall be documented in the service manual in an appropriate manner.

### 6.6    Switches and jumpers

**6.6.1** If switches or jumpers that have the potential to cause the machine not to comply with this part of GRA/TS-GM/2024, or with legislation, are present, then setting them in a manner that would result in non-compliance shall cause the machine to enter "Tilt" mode, which in turn shall be signaled to the local monitoring and control system. As long as the switch or jumper is set in this manner, it shall not be possible to reset the machine.

**6.6.2** All switches and jumpers that have the potential to affect the communications or operational characteristics of the machine shall be documented for evaluation by the test laboratory (TL)

### 6.7    Communication

**6.7.1** Where multiple machines communicate over a single multidrop transmission medium, each machine shall operate at an accurate and consistent baud rate, which shall ensure consistently accurate and error-free communication (over and above the error checking and correction requirement).

**6.7.2** Ports for communication cabling shall be clearly and permanently labelled according to their function.

**6.7.3** Ports for communication cabling (other than external ports used exclusively for auditing) shall be located within a secure area to prevent unauthorized access to the ports and to the attached cables.

**6.7.4** The connection or interaction of a machine with a local monitoring and control system shall not affect the function of the machine or affect the game in any way, other than to

a) disable the machine or game under the appropriate, approved

circumstances (for example, such as when off-line to the next point in the local monitoring and control system), and

b) introduce small delays (unperceivable to the player) in the duration of the game, so as to facilitate communication with the local monitoring and control system.

*NOTE The general nature of the embedded processor usually found in machines sometimes needs a momentarily "hold off" of the next round of communication from the machine to the local monitoring and control system owing to the sequencing or timing of communications to the local monitoring and control system by a multitude of connected machines.*

**6.7.5** Where any data (for example, credits, metering information, activation or de-activation commands, information that pertains to a game outcome and error events) are transferred between a machine and an external device, such as components of a local monitoring and control system, an error detection and correction system shall be supported.

**6.7.6** The means of communication shall be designed and implemented to automatically, continuously and timeously ensure that all data is accurate and reliable.

a) The measure of accuracy shall be an error rate of 0,1 % or less.

b) The measure of reliability shall be a data failure rate of 0,1 % or less.

**6.8     Printers** (if applicable)

**6.8.1** If a machine is equipped with a printer, the printer shall be located in a secure area other than the logic area.

**6.8.2** The printer paper shall be easily replaced without any need to access the logic area of the machine. Instructions for the loading of printer paper shall be given in the operating manual.

**6.8.3** The software shall register and react to any printer fault conditions and shall allow the machine to complete the printing of the current ticket (if possible) and then pause printing and display appropriate on-screen messages.

**7 Transaction system requirements**

**7.1 Coin acceptance systems**

**7.1.1**     Each coin inserted shall register the actual rupee and cents value or the number of credits on the player's credit meter or bet meter. If

registered directly as credits, the conversion rate shall be clearly stated or be easily discernible from the machine.

**7.1.2**    During periods when the gambling equipment is inoperable for any reason, all coins shall either be prevented from being inserted, or be rejected.

**7.1.3**    The coin input system shall have means by which it can detect or logically deduce (or both) when potential cheating is in progress

**7.1.4**    In games where tokenization is used, each valid coin inserted shall register a number of credits that are clearly stated on the machine artwork, video or other form of information display.

**7.1.5**    The coin acceptance system (CAS) shall be able to
a) not have its coin path easily altered from the outside of the machine without leaving evidence of physical modification,
b) deliver an accepted coin to the correct area of the gambling equipment,
c) credit the customer's credit balance with the appropriate rupee and cents value or number of credits for each accepted coin, and to return all other coins to the coin tray, and
d) detect and prevent attempted fraud.

**7.1.6**    The software shall direct coins to either the CDD or to the coin drop box. The "CDD full" detector shall be continually 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 after the state change without causing a disruption of coin flow, or creating a coin jam.

**7.1.7**    Diverter operations shall be dependent only on CDD sensor status, not software counters. If a software counter is used, it shall be used in conjunction with a mechanical sensor, which shall override the software counter.

**7.1.8**    Coin validation shall be electronically based and be so designed as to ensure that each coin inserted and accepted as valid by the machine is added to the credit meter and that it updates all appropriate meters.

**7.2 Coin dispensing devices**

**7.2.1** The CDD shall have detection devices to enable the machine to interpret and act upon conditions when the CDD is empty or when the CDD malfunctions.

**7.2.2** The CDD shall be resistant to manipulation such as by the insertion of foreign objects into the output path.

**7.2.3** If a machine can be operated with the use of coins and is fitted with a CDD, the CDD shall be located in a suitably secured area within the machine.

**7.2.4** If the machine does not issue clear instructions on the steps necessary either to perform a CDD refill or to reset the fault when a "CDD jam", "CDD empty" error message or equivalent wording is displayed, then these instructions shall be clearly set out in the operator manual.

**7.2.5** If power to the CDD is removed, the CDD should not dispense extra coins. If additional coins are dispensed, this shall only be acceptable as long as this extra payout is not reflected on the machine's meters, and therefore does not affect the collection of taxes.

**7.2.6** A machine shall not permit a cashout to be performed during any of the following conditions:

a) during game play

b) while the machine is in demonstration, test or audit mode; an

c) while the machine is in a fault condition that requires manual activation.

*NOTE   Manual reactivation implies that the machine is reactivated for game play before the cashout is permitted*

**7.2.7** If the value of the prize, when added to the player's current credits, exceeds the "maximum credit" setting in the machine, the value of the prize shall be dispensed directly from the CDD or a hand pay shall be initiated.

**7.2.8** The design and construction materials of a CDD shall be of an acceptable quality and the CDD shall require no adjustments for at least the manufacturer's recommended maintenance period.

## 7.3 Bill acceptor system

**7.3.1** The banknote acceptor device shall perform a self-test at each power up. In the event of a self-test failure, the banknote acceptor

shall automatically disable itself (i.e. enter banknote reject state) until the error state has been cleared.

**7.3.2** If burning materials enter a banknote acceptor, the only degradation permitted is for the acceptor to reject all banknotes. Entering a state where either incorrect banknotes are accepted, or correct banknotes are accepted but not credited to the customer, is not acceptable.

**7.3.3** If liquids are spilled into a banknote acceptor, the only degradation permitted is for the acceptor to reject all banknotes. Entering a state where either incorrect banknotes are accepted, or correct banknotes are accepted but not credited to the customer, is not acceptable.

**7.3.4** Any interconnecting cable or plug (or both) relative to the banknote acceptor shall have some form of strain relief. Knots in the cables when passing through holes in the cabinet or housing are not an acceptable means for achieving such strain relief.

**7.3.5** Interconnecting cables from the banknote acceptor device to the Gaming Machine shall not be exposed external to the Gaming Machine or readily accessible to unauthorized staff.

**7.3.6** The banknote storage area (for example, receptacle) shall be attached to the GAMING MACHINE in such a manner that it cannot be easily removed by physical force. It may be located within the GAMING MACHINE or attached to the base on which the GAMING MACHINE  is positioned.

**7.3.7** The relevant jurisdiction may grant dispensation for this requirement if it can be demonstrated that an external banknote acceptor has at least the same degree of security as one located inside the GAMING MACHINE. Areas of security that should be examined when considering such a dispensation are:
a) physical strength of the attached banknote acceptor device; and
b) position and type of fixings (for example, screws, nuts, and bolts).

**7.3.8** The designated path which banknotes traverse and associated handling devices shall be designed so that they resist jams and do not impair travel during insertion, acceptance, depositing or expulsion of banknotes.

**7.3.9** The designated path which banknotes traverse and associated handling devices shall be of solid construction.

**7.3.10** Any access to the banknote acceptor components shall disable the GAMING MACHINE from game play until such time as the access has been cleared.

**7.3.11** Any GAMING MACHINE that has both a coin and a banknote acceptor is required to include a number of security features as follows:
a) access to the coin drop box shall not give access to the banknote storage area;
b) access to the banknote storage area shall not give access to the coin drop box; and
c) the GAMING MACHINE shall be able to cater for simultaneous input of banknotes and coins.

*NOTE The rejection of either or both is acceptable.*

**7.3.12** All points in the banknote path shall be easily accessible to allow for inspection and clearance by service personnel once valid access is gained to the area in which the banknote acceptor is housed. Actions intended to be carried out by persons other than licensed technicians shall not require the use of tools.

**7.3.13** The banknote acceptor shall be easily removed for inspection by service personnel.

**7.3.14** Access to banknote acceptor components and banknote storage areas shall be secured by means of key lock. Access doors for both areas shall be fitted with "door open/close" sensors (use of the main door sensor for access to banknote acceptor components is acceptable).

**7.3.15** An GAMING MACHINE that contains a banknote acceptor device shall maintain sufficient metering to be able to report the following:

a) the total monetary value of banknotes accepted (banknote money in);

b) the number or value of banknotes accepted for each banknote denomination; and

c) the individual MUR value of each of the last five banknotes accepted.

*NOTE These meters are master meters, i.e. to be cleared only on master reset of the GAMING MACHINE.*

**7.3.16** An GAMING MACHINE with a banknote acceptor installed shall comply with the hardware requirements of this part of GRA/TS-GM/2024, including specifically electrical safety and radio interference regulations. GAMING MACHINE which have been previously approved to which banknote acceptors are to be added, shall be retested for compliance with these requirements. Where previous test reports have been supplied, new certification shall be obtained with an GAMING MACHINE submitted for test installed with the banknote acceptor and all other modifications. For example, specific tests that may require additional testing before re-certification are

a) electrostatic discharge,

b) power surges,

c) radio frequency interference, and

d) EMI.

**7.3.17** Any access required to clear a banknote jam shall not give access to the banknote storage area, except if the jam occurs inside the banknote storage area.

**7.3.18** The keys that open the locks on the banknote storage door shall be different from the standard outer door or banknote outer door. They may be the same as the coin drop box door keys.

**7.3.19** The banknote acceptor device shall have a banknote storage area (for example, receptacle) full sensor. This shall be indicated on the GAMING MACHINE. The banknote acceptor shall disable itself when full but game play may continue.

## 7.4 Bill validator system

**7.4.1** It shall not be possible to successfully disable any validation feature and thus register any counterfeit banknote as a valid banknote.

**7.4.2** Acceptor devices shall incorporate sophisticated detection methods to validate banknotes by suitable evaluation methods.

**7.4.3** Banknote acceptors shall be factory set only; it shall not be possible to access or conduct maintenance or adjustments in the field, other than
a) the selection of banknotes and limits, or
b) changing of approved EPROMs or downloading of approved software.
The adjustment of the tolerance level for accepting banknotes of varying quality, or the alteration of any of the possible checking procedures is prohibited in the field. If a banknote acceptor has multiple tolerance levels, the ability to switch to lower levels shall be disabled.

**7.4.4** If the banknote acceptor only accepts banknotes in a particular direction, orientation or with a particular side facing up, there shall be sufficient instructions on the GAMING MACHINE artwork to clearly indicate this to the player. A label with a symbolic sign of the banknote orientation attached near the banknote entry point is considered to be the best method of complying with this requirement.

**7.4.5** The GAMING MACHINE may have a facility where the banknote acceptor operation can be disabled or enabled by means of an action not available to the player, for example, audit mode or GAMING MACHINE cabinet access. In the instance of the banknote

acceptor being disabled, the GAMING MACHINE can still be played using coin input.

**7.4.6** A GAMING MACHINE shall not register credits as the result of banknote input until the banknote has passed the point where it is possible to be rejected by the acceptor or to be withdrawn.

**7.4.7** All invalid banknotes shall be rejected and returned to the player.

**7.4.8** Under no circumstances may credits be lost if banknotes are input during game play.

**7.4.9** All acceptance devices shall be able to detect the entry of valid banknotes and provide a method to enable the GAMING MACHINE software to interpret and act appropriately upon a valid or invalid input (for example, the insertion of counterfeit banknotes).

**7.4.10** The GAMING MACHINE shall be able to detect a banknote jam that has occurred.

**7.4.11** A banknote acceptor device shall be implemented with a means to enable or disable particular value banknotes. The procedure for setting acceptable banknote values shall be by access to a secure area of the GAMING MACHINE. If permanent artwork is used to display the acceptable denominations, the latter method, which requires attending to each GAMING MACHINE, is preferred.

**7.4.12** The acceptance device(s) shall be electronically based and configured to ensure that it only accepts valid banknotes of legal tender or coupons approved for that jurisdiction and rejects all others.

**7.4.13** An acceptance device shall include a mechanism which prohibits the input of any banknotes, or alternatively, rejects all banknotes entered, during periods when the GAMING MACHINE is inoperable or deactivated for any reason.

**7.4.14** The GAMING MACHINE, if configured for a banknote acceptor device, shall not activate the banknote acceptor if any part

of the banknote acceptor that relates to the validation process, or to delivery of the banknote to the storage area, is missing.

**7.4.15** All accepted banknotes shall be deposited into the secure banknote storage area.

**7.4.16** A banknote acceptor receptacle full condition need not disable the GAMING MACHINE but shall disable banknote input.

**7.4.17** In the case of GAMING MACHINE that support banknote acceptors that implicitly implement tokenization of the GAMING MACHINE, the following requirements apply to this tokenization aspect:

a)      each valid banknote inserted shall register the actual MUR value or the correct number of credits for the current game. If registered directly as credits, the conversion rate shall be clearly stated on the GAMING MACHINE; and

b)      the GAMING MACHINE shall ensure that all banknotes accepted shall correctly increment the player's balance (GAMING MACHINE or account as the case may be) and relevant meters in all circumstances. This includes but is not limited to cases of power failure, door open, coin tilt, audit mode entry or any other form of deactivation of the GAMING MACHINE.

**7.4.18** If banknote input messages received from the banknote acceptor are to be maintained in the memory of a GAMING MACHINE for a period of time without being added to the player's credit balance, the storage of these messages shall be maintained in, and comply with the critical memory requirements. The GAMING MACHINE shall be able to recover these messages whenever it restarts, especially after a power failure or similar event.

**7.4.19** The banknote acceptor device shall employ a reliable means of transmitting credit values to the GAMING MACHINE. Pulse stream interface or serial communication without error detection and correction are not considered to be reliable communication methods.

**7.4.20** The banknote input system shall be constructed in a manner that protects against vandalism, abuse or fraudulent activity. As a guide, the following might be tested:

a) ability to prevent manipulation by the insertion of foreign objects into the banknote input system;

b) ability to prevent easy alteration to the banknote path from the exterior of the GAMING MACHINE without leaving evidence of physical modification of the device; and

c) ability to deliver a banknote to the banknote storage area receptacle.

**7.4.21** An alarm shall be raised for any of the following banknote acceptor specific conditions, unless done by staff authorized to do so and in accordance with an approved procedure:

a) opening of the banknote acceptor area outer door (if separate from the GAMING MACHINE main door); or

b) opening of the banknote storage area door.

## 7.5        Electronic funds transfer

**7.5.1** If cards or other devices that employ a form of electronic storage of data are to be used, the TL shall be satisfied with all aspects of security. Some of the major concerns are:

a) prevention of illegal or accidental alteration of data;

b) protection from loss of data;

c) recovery of information relating to damaged or lost storage devices (for example, cards);

d) accuracy of read/write operations;

e) protection from fraudulent duplication of card information or credit balances;

f) maintenance of all EFT transactions in a system log;

g) recovery of all EFT transactions after failure of the system; and

h) correct updating to the storage media and to the system of all electronic funds transactions.

**7.5.2** The machine shall maintain a record of, as a minimum, the last 10 successful EFT transactions. Each transaction record shall, as a minimum, include the date and time of the transaction and the actual

amount transferred. It is acceptable if the information is only available from the LMCS in an EFT environment.

**7.5.3** If EFT is used for gambling against a player account, no bet may exceed the available balance of an account.

**7.5.4** The machine card reader shall not accept an illicit card or a card that is not authorized for use.

### 7.6 Credit redemption

**7.6.1** If a patron attempts to collect available credits, and the total coin value of those credits is less than the maximum CDD pay amount, the machine shall dispense the equivalent value in coins from the CDD.

**7.6.2** If a player attempts to collect available credits, and the total coin value of those credits exceeds the maximum CDD pay amount or, if after a CDD pay the patron attempts to collect any residual credits (for example, in a tokenized game), the machine shall either

a) generate a validated ticket for cash redemption, or

b) initiate a funds transfer to an appropriate player account, or

c) automatically lock-up and go into a handpay or cancel credit, whereby the player is given the option either to receive a cancelled credit or to cancel the cancel credit and play out the remaining credits.

**7.6.3** Whenever credits are redeemed by a player, the number of credits paid out shall be clearly displayed (collect display) and shall be correspondingly removed from the credit display. In addition, the monetary value of the amount redeemed may be displayed.

**7.6.4** When there are "odd credits", or residual credits (such as less than the CDD base coin) in the player balance and a collect is attempted on a machine with a CDD, the machine shall pay out the balance as if it were a "large credit balance" (for example, by cash ticket or cancelled credit) instead of from the CDD. Alternatively, if a machine does not have this function, or if this function is disabled, there shall be a clear message on the machine in a prominent position, and in a font large enough to be easily read at a distance of three meters, that states that "This gambling machine does not pay out any credit amount less than <value>" (insert appropriate value in the message), or equivalent wording.

**7.7 Cashout by printed ticket**

**7.7.1** A valid ticket shall contain the following information:
a) the name of the licensed venue;
b) the unique machine identification number;
c) the current date;
d) the time of day;
e) the value of the credit in numbers and words
f) the unique identifying number of the ticket voucher; and
g) the validation (checksum) number, QR code or bar code.
**7.7.2** QR codes, Barcodes or other form of machine-readable markings on a voucher shall have enough redundancy and error checking to ensure that 99,9 % of all misreads are flagged as an error.
**7.7.3** Ticket voucher printing, as a method of credit redemption, is only permissible where the machine is linked to a system or cash control system which allows validation of the printed ticket at a cashier station. Where a payout is by ticket voucher printed by the gambling equipment, the gambling equipment shall be capable of printing a ticket voucher for all credits owed to the player at the completion of each game.
**7.7.4** A ticket request shall be rejected by the system if the device that generates the ticket security feature is not able to issue such a feature, and the system shall initiate the appropriate error handling procedure.
*NOTE A security feature includes any mark, attribute or element (for example, a ticket number) that is added or attached to the ticket in order to allow the ticket to be validated.*

**8 Software requirements**

**8.1      Source code**

**8.1.1      General**

**8.1.1.1** All source code shall be appropriately documented to ensure that TL is able to identify modules and revisions. The TL shall ensure that the program or source code modules have not been modified.

*NOTE This does not apply to commercially available software that has no effect on the game play or game result determination.*

### 8.1.2 Verification

**8.1.2.1** All program source codes for machines shall be made available for examination by the TL.

**8.1.2.2** The party that submits software shall provide the wherewithal to demonstrate, or otherwise prove to the satisfaction of the TL, that the source code supplied conforms to the same executable code as contained in the firmware program store of the machine submitted for certification.

**8.1.2.3** When compiled, all source codes supplied to the TL shall generate an object code that is exactly the same as that installed in the machine.

**8.1.2.4** If redundant sections of code exist in the program, the supplier shall provide an indication of the areas of code which are redundant.
*NOTE One way of achieving this goal is to use compiler directives that omit sections of code (for example, if a particular compiler option is set or not set).*

### 8.2    Critical memory requirements

### 8.2.1    Critical memory
Critical memory shall store all critical data.

### 8.2.2    Maintenance

**8.2.2.1**   To cater for disruptions that occur during the update process of critical memory, at any point in time during an update there shall exist sufficient information that allows the software to fully cater for such disruptions (for example, the software shall be able to identify the state of each copy of critical memory and recover from the most appropriate good copy to complete the update in each case of a disruption).

**8.2.2.2**   The result of the critical memory validation shall be stored and kept always up to date (i.e. shall be updated after every instance of critical memory change).

**8.2.2.3**   A validity check of critical data memory shall be undertaken at least before a game play.

**8.2.2.4**   When meters in critical memory are being updated, the software shall ensure that errors in one copy of the meter readings are not propagated to other good copies.

### 8.2.3    Detection of corruption

**8.2.3.1** Any failure of a validity check shall be classed as either recoverable memory corruption, if at least one copy of critical memory is established to be good, or unrecoverable memory corruption.

**8.2.3.2** A validity check of machine critical memory shall be undertaken at least after every restart of the device or transaction of significance (for example, logic door closed, door closed, parameter change or reconfiguration). After a device restart (for example, power off and on), the device shall complete its validity check of the critical memory area and then perform a comparison check of all good copies of critical memory.

### 8.2.4 Recovery

**8.2.4.1** If the machine is so designed that after an uncorrectable memory corruption it is possible to view all copies of meters, the machine shall highlight which of these figures are expected to be good as opposed to those that might be corrupted.

**8.2.4.2** An unrecoverable memory corruption shall result in a RAM error.

**8.2.4.3** If an unrecoverable memory corruption occurs, it shall require a master reset.

**8.2.4.4** If validity checking of critical memory information fails, and data memory remains operational, the software could recover critical memory information in order to continue game play. This option has the following implications:

a) all logical copies of critical memory shall be recreated using the good logical critical memory as a source; and

b) the device shall verify that the recreation of the critical memory was successful before attempting to identify any permanent physical memory failure. If such permanent memory failure is determined, the device shall

enter the unrecoverable memory corruption sequence.

## 8.3 Program memory storage

### 8.3.1 Labelling

All program storage media shall be uniquely labelled, identifying the following:
a) the program name (and the software shell name, if applicable);
b) the name of the manufacturer;
c) the development number or the variation;
d) the version number;
e) the type and size of media; and (if applicable);
f) the location in the machine (if critical).

### 8.3.2 Write-once read-many (WORM) memory

**8.3.2.1** A WORM (for example, CD-ROM) used as a program or fixed data storage device shall be written such that only the actual program and data required are written to the WORM.

**8.3.2.2** The operational software shall provide an integrity check method to verify that there are no additional or missing program or data records/files on the WORM.

**8.3.2.3** There shall be an ability to conduct an integrity check independent of the device's operational software to verify that there are no additional or missing program or data records/files on the WORM (for example, inserting a CD-ROM in another PC which then conducts a full signature check and directory search check over the CD-ROM space).

### 8.3.3 Reprogrammable memory

**8.3.3.1** If a reprogrammable memory device is irreversibly configured at the hardware level as a read-only device (for example, the write line is cut off), it shall be treated for all purposes as an EPROM.

**8.3.3.2** A reprogrammable memory program storage device shall be protected from unauthorized modification. Modification shall only be permitted once the TL and the GRA are satisfied with the appropriate security measures (for example, if a high-voltage chip that allows

modification of the reprogrammable memory devices is installed on the printed circuit board (PCB)). The method of securing the reprogrammable storage device shall be verified by the TL and certified by the GRA on a case-by-case basis.

**8.3.3.3** Before the termination of any programming operation on reprogrammable memory, each byte programmed shall be verified by a program comparison controlled by the programming device.

**8.3.3.4** Only the actual program and fixed data required shall be written to the reprogrammable memory device.

**8.3.3.5** Jumpers or similar devices can be used to enable or disable erasure or writing to reprogrammable memory provided there is a feedback signal to the software so that the setting of the jumper position can be recorded or appropriately acted upon. If a jumper or a switch is set to "Write", then the machine shall not be able to enter "Play" mode. These jumpers shall be located within the logic area of the machine.

**8.3.3.6** All reprogrammable memory devices shall be housed in a secure area.

### 8.3.4 Read/write storage

**8.3.4.1** A read/write storage device (for example, a disk or a tape) used for storage of program or fixed data shall be written in such a way that only the actual program and fixed data required by the program are written to the storage device.

**8.3.4.2** The operational software shall provide an integrity check method to verify that there are no additional or missing program or fixed data records/files on the storage device.

**8.3.4.3** There shall be an ability to conduct an integrity check independent of the device's operational software to verify that there are no additional or missing program or data records/files on the storage device.

**8.3.4.4** All methods of integrity checking shall have the ability to identify files/records that contain variable data and exclude them from the signature calculation.

### 8.3.5 ROM program storage

All unused areas of ROM shall be written with the inverse of the erased state, which for most EPROMs are zero bits (00 hex), rather than one bits (FF hex).

### 8.3.6 Verification

**8.3.6.1** All non-critical memory RAM shall be checked for corruption at each power up.

**8.3.6.2** All devices that contain program memory or critical memory shall be validated by software. This validation may include self-checking by specific devices with internal programs. RAM and program storage device space that is not critical to machine security need not be validated.

**8.3.6.3** Memory that does not change dynamically (for example, EPROM) shall be validated by the machine at least every time the hardware is reset (for example, at power on), every time the software is reset (where this is possible) or after a type 4 significant event. Any type 4 error should be unlocked by the defined GRA procedures. Failure of the validation shall be reported to the LMCS, if possible.

*NOTE 1 Equipment in a casino environment does not need to be capable of doing signature checking in response to a request from the LMCS.*

*NOTE 2 The fact that the machine activates normally is deemed to be proof that validation was successful.*

**8.3.6.4** If a validity check of the software fails, it is understood that this means that the machine cannot function, in which case it shall disable itself immediately.

*NOTE   Excludes transaction devices that do not influence the game results.*

**8.3.6.5** The integrity of the operation of the device shall be protected from nefarious or accidental use of the unused portions of the program memory storage media.

### 8.4    Random number selection process

### 8.4.1 General

**8.4.1.1** The RNG shall be contained in the machine logic Area. The outcome of a gambling game shall only be determined in the logic area of a machine. The critical memory of a machine shall only be contained in the logic area of the machine.

**8.4.1.2** The method of random number generation is not mandated. A pseudo-random number generating algorithm, a dice shaker, a selector of keno balls, or a roulette wheel, etc., can all be acceptable RNGs where these comply with the GRA's requirements.

**8.4.1.3** If a software-based RNG is used, the choice of algorithm is at the discretion of the supplier of equipment.

**8.4.1.4** If, for any reason, the background RNG activity is interrupted (for example, in the case of machine power down), it shall not be possible for the next input variable(s) for the RNG to be duplicated (such as in different machines). The method of generating the next input variables under these circumstances shall be subject of evaluation.

**8.4.1.5** RNG tests that might be applied include the following:
a) the chi-square test;
b) the equi-distribution (frequency) test;
c) the gap test;
d) the poker test;
e) the coupon collector's test;
f) the permutation test;
g) the run test (patterns of occurrences shall not be recurrent);
h) the spectral test
i) the serial correlation test potency and degree of serial correlation (outcomes shall be independent from the previous game); and
j) a test on subsequences.

### 8.4.2 RNG requirements

Game software shall generate random symbols from an RNG that uses a mapping algorithm. The fundamental requirement is that the use of an RNG shall result in the selection of game symbols or the production of game outcomes that can be proven to ensure that
a) The output of the symbols from the RNG is not predictable

b) Any outcomes derived from the RNG are uniformly distributed.

c) Any mappings to convert random numbers into game symbols are linear, and the distribution of the mapped symbols is identical to the distribution of the unmapped random number from which they were derived.

d) The mapped random number sequence shall demonstrate that they are statistically random when subject to the same statistical tests for randomness specified for the base RNG.

e) The game outcomes, which are derived from either a combination of mapped symbols or directly from the unmapped random numbers, shall have the same distribution and probability of occurrence as the game that the machine implements. In particular, poker games shall have the same first hand distribution and probability as hands dealt from a randomly shuffled deck of cards; spinning reel games shall have the same outcome probabilities and outcome distribution as the physical model upon which the game is based, and so on.

### 8.4.3 Cryptographic RNG

### 8.4.3.1 General Statement.

A cryptographic RNG is one that cannot be feasibly compromised by a skilled attacker with knowledge of the source code. "Cryptographically strong" means that the RNG is resistant to attack or compromise by an intelligent attacker with modern computational resources, and who may have knowledge of the source code of the RNG. The following RNG requirements apply to a cryptographic RNG and are being introduced to this technical standard as optional requirements. At its discretion, a regulatory body may elect to require that RNGs used in the determination of game outcomes be cryptographically strong.

### 8.4.3.2 RNG Attacks.

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

a) Direct Cryptanalytic Attack: Given a sequence of past values produced by the RNG, it shall be computationally infeasible to predict or estimate future RNG values. This must be ensured through the appropriate use of a recognized cryptographic algorithm (RNG algorithm, hash, cipher, etc.);

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

b) Known Input Attack: It shall be infeasible to computationally determine or reasonably estimate the state of the RNG after initial seeding. In particular, the RNG must not be seeded from a time value alone. The manufacturer must ensure that games will not have the same initial seed, even when powered-on or booted simultaneously. Seeding methods shall not compromise the cryptographic strength of the RNG; and

c) State Compromise Extension Attack: The RNG shall periodically modify its state, through the use of external entropy, limiting the effective duration of any potential exploit by a successful attacker

## 8.5    Information display

### 8.5.1    Display methodology

**8.5.1.1** Language Support: All information technologies must provide support for the English language. Specifically, all display technologies and software must support the ISO/IEC 10646 character set.

**8.5.1.2** External displays employed in communicating the results of games shall be reviewed on a case-by-case basis by the GRA.

**8.5.1.3** Symbols of virtual reel games (video) shall appear to the player in the same arrangement as per the reel strips. The order of the symbols of the reel displayed to the player shall not be manipulated or rearranged.

### 8.5.2    Recovery

In the event of a non-destructive fault or failure, deactivation or interruption, the machine shall be able to recover with no loss to the player or of critical data to the local monitoring and control system. An error- catching routine shall exist that prevents the machine from displaying a win amount that exceeds the maximum payout displayed on the pay table, except when participating in a jackpot.

Once connected, all malfunctions detected by the diagnostic system must be reported to the central electronic monitoring system in accordance with the specifications of the G2S protocol.

### 8.5.3    Last game information

**8.5.3.1** All machine shall be capable of storing and displaying last game data for at least the five most recently played games.

**8.5.3.2** The following information on the last game played (the game before the current game) shall be retrievable:
a) the type of game played;
b) the award table used;
c) display card values, reels in position, or other game status information;
d) the total number of credits or monetary value at the start of the game (less credits bet);
e) the total number of credits or monetary value played;
f) the player choices (if any) involved in the game outcome;
g) the total number of credits or monetary value associated with the award resulting from the last play (win);
h) the total number of credits or monetary value added after the last game;
i) the total number of credits or monetary value collected or cancelled after the last game;
j) a display of all feature games following the last game display (if possible). Otherwise at least the metering information shall be preserved; and
k) the jackpot amount (if any) and an indication if won or not.

**8.5.3.3** In the case of a stepper motor machine, this means spinning the reels to the final resting point at the completion of the game and illuminating or flashing any lights or other indicators that were illuminated or flashing at the end of that game. The wheels, lights and display shall be returned to their original states when the viewing of the last game replay is completed.

**8.5.3.4** In the case of spinning reel games, the machine shall display at least the final resting place of the reels, the options (play lines or number of coins selected (or both) and an indication of winnings, in a way similar to that originally shown to the player.

**8.5.3.5** In the case of keno and bingo games, all of the balls drawn, the selections made by the player and the final result shall be displayed in a

way similar to that originally shown to the player.

**8.5.3.6** In the case of card games, all cards dealt in a game shall be shown on the screen. In the case of poker or any other game with a hold/discard strategy it is necessary to show the symbols or cards held and those discarded.

## 8.6    Prescribed display formats

**8.6.1**    If dates and times are displayed, they shall be displayed in a consistent in 24-hour format i.e. dd.mm.yyyy:hh:mm:ss.

**8.6.2**    Field separators within times shall be colons ( : ) or full stops ( . ). Time of day shall be given as MUT.

## 8.7    Communication with LMCS

**8.7.1**    The means of communication shall be reviewed and verified by the TL to conform to the requirements of this part of GRA/TS-GM/2024. The verification of results shall be possible to be performed after installation.

**8.7.2**    The means of communication shall be designed and implemented to automatically and continuously ensure that all mandatory data
a) metering and transactional data,
b) significant events,
c) critical data, and
d) system security and management data, including time synchronization data
are communicated from the machine to the Local server and is available for the specified accounting and reporting periods.

**8.7.3**    If the machine is unable to send messages to the local monitoring and control system, then the machine may complete the current game and permit cashout but shall then disable further game play until able to forward these messages to the local monitoring and control system.

**8.7.4**    All machines shall be able to handle the following range of failures without loss of data:
a) failure of the central computer local area network (LAN) interfaces;
b) failure of the central LAN;

c) failure of central data communication interface devices;

d) failure of single data communication interface;

e) high data communication error rates on line;

f) a foreign or additional device placed on a LAN;

g) a foreign or additional device placed between LAN bridges, communication controllers, or on data communication lines between sites;

h) single data communication port failure on remote controller (if any);

i) LAN failure on regional or local controller (if any);

j) LAN failure on cashier terminal (if any); and

k) data communication interface failure on a machine.

**8.7.5** Jackpot or progressive jackpot controlling devices shall communicate with the local monitoring and control system by means of a protocol-based form of communication. This does not apply to stand-alone jackpot or progressive controllers.

**8.7.6** The means of communication shall be designed and implemented to automatically, continuously and timeously ensure that all data is accurate and reliable.

**8.8    Metering — Auditing meters**

*NOTE It is the intention of this sub-clause to have a common designation for the values on reports or shown on-screen. It is not intended to refer to designations used in any protocol or messaging system.*

**8.8.1** Unless otherwise specified in legislation, the value displayed by the meter may be in either credits or in monetary values (for example, Mauritian rupees (MUR) and cents) as long as the units used are clearly shown near to the meter or display.

**8.8.2** The "total bet" meter is defined as the total value of all credits bet. In the case of multigame machines this meter is also required and a separate value shall be maintained for each configured game on the machine.

**8.8.3** The "total win" meter is defined as the total value of all credits won. In the case of multigame machines, this meter is also required and shall be maintained for each configured game on the machine.

**8.8.4**    The "total coin box drop" meter is defined as the total value of coins or tokens to the coin box drop of the machine. An additional period meter is required in audit mode that can be reset following each clearance of the coin drop storage area.

**8.8.5**    The "total games played" meter is defined as the total number of games started and completed on the machine. The units shall be in games. In the case of multigame machines this meter is also required and shall be maintained for each configured game on the machine.

**8.8.6**    The "total hand pays" meter is defined as the total value of all hand pays, including hand pays less than one coin or token, hand pays greater than the CDD limit, and any printed tickets and vouchers. If a machine keeps separate meters for "cancel credits", "voucher out" or "hand pay with jackpot" then the summation of these meters to derive a total amount for "Total hand pays" may be done by the LMCS.

**8.8.7**    The "total cash in" meter is defined as the total value of all cash entered into the machine (including amounts transferred from a card in an EFT environment). Separate meters for "cash", "EFT transactions" and "tickets/vouchers" that shall be added in order to derive the "total cash in" amount are acceptable.

**8.8.8**    The "total cash out" meter is defined as the total value of all cash paid out of the machine (including hand pays, printed tickets and vouchers and amounts transferred to a card in an EFT environment). Separate meters for "cash" "EFT transactions" and "tickets/vouchers" that shall be added in order to derive the "total cash out" amount are acceptable.

**8.8.9**    The "total EFT in" meter is defined as the total value of all credits transferred from a card to a machine in an EFT environment. If the machine does not support EFT, this meter is not required.

**8.8.10**    The "total EFT out" meter is defined as the total value of all credits transferred to a card from a machine in an EFT environment. If the machine has an EFT functionality, this shall be designated on all reports or displays as "Total EFT Out". If the machine does not support EFT, this meter is not required.

**8.8.11**    When a meter, of any type, reaches its maximum value, it shall

automatically revert (for example, "wrap round") to zero and subsequently continue counting (from zero) in the normal way.

**8.8.12** Gambling equipment shall have access to a function that enables the display of all metered information retained by the gambling equipment. It is not mandatory that metering information be displayed on the device from which the information originates. The information may be displayed on an external device or on a computer (or on both) to which the machine has communicated such information.

## 8.9    Metering — Player displays

**8.9.1**    A machine shall be able to display the information given in 8.9.2 to 8.9.20 (inclusive) to the player (as applicable to either "EFT" or "non-EFT" environments). Note that this does not prevent more than one piece of information being presented on the same display unit, provided that the associated artwork is not deemed to be misleading.

**8.9.2**    The "credit display" shall display the current number of credits available to the player under the heading "Credits". This display shall be updated immediately after each bet is made and at the end of the game when it shall be increased by the value displayed by the "Win" display. It is acceptable to additionally display the MUR value if desired.

**8.9.3**    The "bet display" shall display the cumulative total number of credits bet by the player during the current game to the player under the heading "Bet". This display shall be updated at the start of each game. It is acceptable to additionally display the equivalent MUR value if desired.

**8.9.4**    The "win display" shall display the (cumulative) number of credits won for each win won by the player during a single game (and, therefore, the prize that has been won at the completion of each game) to the player under the heading "Win". This display shall be updated at the occurrence of each new win, and at the start of each game. It is acceptable to additionally display  the equivalent MUR value if desired.

**8.9.5**    The "collect display" shall display the number of credits collected from the machine by the player under the heading "Collect" or "Paid". This display shall be updated each time the player collects credits from the machine (whether by CDD, hand pay, printed ticket or voucher, or EFT card) and at the start of each game. It is permissible to display, in

addition to the credit amount, the equivalent MUR value, if desired.

**8.9.6**    Player displays may be incremented or decremented (for example, stepped) to the value of the actual meter for visual effect. However, the value contained in the internal storage of these displays shall be immediately increased (not incremented or decremented over a period of time).

**8.9.7**    The number of credits collected shall be subtracted from the player's credit display.

**8.9.8**    The value of the win display shall only be added to the player's credit display.

**8.9.9**    The player's credit display shall always be prominently displayed in all modes except audit, configuration and test modes. During play in second screen bonus features, the player's credit amount does not need to be displayed, provided that the player is not required to bet additional credits during the feature.

**8.9.10**    The player's credit display shall have sufficient digits to allow the display of at least twice the credit value of the maximum prize. Tokenization and denomination configurable parameter options shall not permit credit values that are greater than the above to be displayed.

**8.9.11**    Whenever credits are bet (for example, at the commencement of the game or in the event of additional wagers during a game) the number of credits bet shall be immediately subtracted from the player's credit display and displayed on the bet display.

**8.9.12**    It is mandatory for a multigame machine to show the monetary value of the player's available credits on the game select screen. The monetary value of the player's available credits may also be shown on each game play screen in addition to the player's available credits for that game. This requirement is optional for a single game machine.

**8.9.13**    If the current MUR amount is not an even multiple of the tokenization factor for a game or if the credit amount has a fractional component, the credits displayed for that game may be displayed and played as a truncated amount for example, fractional part removed). However, the fractional credit information shall be made available to the

player when the truncated credit balance is zero or on the game select screen.

**8.9.14** At least the following displays shall be able to be shown separately for each game offered on a multi-game machine:
a) the total of all credits bet; and
b) the total of all credits won.

**8.9.15** Prize determination shall
a) be clearly specified on the display or on the exterior of the device, or be easily accessible to the player, and
b) be exclusively a consequence of the outcome of a computer based RNG in conjunction with the prevailing payout table and rules of the game.

**8.9.16** There shall be a game selection screen where the full amount of the player's credit balance is displayed either in MUR and cents or in credits.

**8.9.17** Only credits taken as wins by the player or automatically credited by the machine shall be added to the "Win" meter.

**8.9.18** When residual credits are played off, credits bet shall be added to the "Total bet" meter.

**8.9.19** When residual credits are played off, and if any credits are won, the value of the win shall be added to the "Total win" meter and shall either
a) increment the player's credit meter, or
b) be automatically dispensed, and the value of the coin(s) added to the "Coins out" meter.

**8.9.20** The value of every prize (at end of game) shall be added to the credit display, except progressives. Progressives may be added to the credit display if either
a) the credit display is maintained in MUR and cents, or
b) the progressive display is incremented to whole credit amounts, or
c) the prize in MUR and cents is converted to credits on transfer to the player's credit display in a manner that does not mislead the player (for example, make unqualified statement "wins display amount" and then round down on conversion) or cause accounting imbalances.

## 8.10     Labelling

All non-mandatory, retrievable electronic statistics or other information shall be suitably labelled.

## 9   Operational requirements

### 9.1     Access to restricted features

Access to the following restricted features of gambling equipment shall be regulated by at least a key switch, or by key-based access to the inside of the machine cabinet:
a) auditing information;
b) statistical information;
c) test functions; and
d) any other features deemed by the GRA to be restricted.

### 9.2     Set-up — Device configuration

#### 9.2.1 Configuration of variables

**9.2.1.1**  A variable required to be set during device configuration or set-up shall not be able to be changed except following a valid memory clearance, unless able to be changed by some other secure method. A machine shall not be able to be operated unless all configuration variables are set. A device may be configured remotely or by direct access.
If memory becomes corrupted, a machine shall not assume default values and recommence gambling operation unless specifically authorized by the GRA.

**9.2.1.2**  A gamble feature bet option shall only be enabled or disabled in setup mode and the appropriate configuration change significant event shall be generated.

#### 9.2.2 Reconfiguration

**9.2.2.1** The machine may be reconfigured to modify the following parameters, but only by a secure method:
a) the mapping of random numbers to cards or symbols;
b) the game or sets of games for play
c) denomination and tokenization; and
d) the paytable.

**9.2.2.2**  All configuration settings required for the proper operation of the

machine shall be entered before the machine can enter "Play" mode. If all configuration settings required have not been entered, the machine shall detect this condition and remain disabled.

### 9.3 System security

**9.3.1** The set of games offered to the player for selection, or their paytables, may be changed only by a secure method. No changes to the set of games offered to the player for selection (or to their paytables) are permitted while there are credits on the player's credit meter or while a game is in progress.

*NOTE The intention is to prevent any modification to the selection of games offered, or to their paytables, as the result of player history. The player may switch between any games offered without terminating the session.*

**9.3.2** Gambling equipment shall disable all player inputs and suspend all gambling functions while any of its secure area doors are opened or remain open.

**9.3.3** Gambling equipment shall not have any functions or parameters adjustable by or through any separate computer, input device or input codes, except for the following:

a) the adjustment of features that are wholly cosmetic (for example, that do not affect functionality in any way);

b) the downloading in an authorized manner of any software, data or operational parameter; and

c) a configuration (set-up) mode.

**9.3.4** In general, the reactivation of a machine that has been deactivated shall require manual intervention by the gambling venue operator or the system operator. The following exceptions apply:

a) if a door open event occurs other than a logic door open, the machine may reactivate automatically when the door is eventually closed;

b) if the personal identification number (PIN) retry limit is exceeded for a player's account card, the machine shall remain deactivated until the card is removed; and

c) if the power supply to a machine fails, the machine is deactivated as a matter of course. It is permitted for the machine to automatically reactivate itself unless it determines that there was a configuration or software change while the power was down, in which case the machine shall remain deactivated until manually reactivated.

**9.3.5**    Where a machine is unable to operate without the loss of any information (for example, metering, transactions or significant events), it shall immediately disable any further game play.

**9.3.6**    If a significant event has not already been logged (by the system or the machine) when deactivation occurs, the machine shall ensure that such an event is reported to the system as soon as possible.

## 9.4    Master reset

**9.4.1**    Following the initiation of a master reset procedure, the game program shall execute a routine which initializes each and every bit in RAM to the default state.

**9.4.2**    It shall not be possible to reset any critical RAM without first accessing the logic area.

**9.4.3**    The default reel position or game display after a master reset shall not be a winning combination on any selectable line. The default game display upon entering game play mode shall also be a non-winning game.

*NOTE The selection of a specific "default" combination that is displayed after every reset is acceptable, as long as it is a non-winning combination (for example, it need not be selected at random).*

**9.4.4**    A configuration setting that is required to be entered during set-up mode immediately following a master reset shall not be able to be changed after the machine leaves set-up mode.

## 9.5    Door open procedures

The following procedures shall be performed on the occurrence of any door open:
a) any software state prior to door opening shall be saved;
b) any game play shall be saved in its current incomplete condition;
c) if mechanical reels are spinning prior to the door opening, the reels shall continue spinning after the door is closed;
*NOTE There should not be a false impression created that the game achieved a result while the door was open, or just prior to the door being opened.*

d) credit input shall be disabled (may be re-enabled for the duration of a credit input test or CDD test);

e) the machine shall clearly indicate that the door has opened and game play is not possible;

f) if in CDD payout, the CDD shall be turned off and the brake applied (may be re-enabled for the duration of a CDD test);

g) all player inputs that can affect a play in progress shall be disabled (unless used in door open/test mode); and

h) cashout of any kind to players shall be disabled.

i) The machine must report the door opening (of one or more device doors) to the central electronic monitoring system of the MRA Data Center. If the opening occurs while powered down, the reports must be transferred immediately after the machine is in playable mode.

## 9.6    Door close procedures

When any door is closed the software shall return to the condition prior to when the first door open state occurred, except when the machine detects that there has been a configuration or software change, in which case it shall send the appropriate message to the LMCS. This means that a) a message or other indication stating that the door has closed, or other indication (for example, such as the disappearance of a message or indication stating that the door was opened) shall be displayed; this may be for a preset period or until the next game play,

b) any relevant player inputs shall be re-enabled,

c) the alarm shall be turned off, and

d) any incomplete game play when the event occurred shall recommence from the beginning of the play or from the point at which interruption occurred and conclude normally, using the data that were saved previously.

## 9.7    Audit mode

**9.7.1**    It shall always be possible to enter audit mode when the machine is in idle mode

**9.7.2**    The device shall not be playable while auditing information is being displayed on the device.

**9.7.3**    It is not mandatory that auditing information be displayed on the

device from which the information originates. The information may be displayed on an external device or on a computer (or on both) to which the machine has communicated such information.

**9.7.4**  It is preferred that all non-game specific player displays (for example, credit display, win display, bet display and collect display) are displayed in the same position for all games.

**9.7.5**  Audit mode shall include as a minimum, the following items:
a) display of all electronic meter and display information;
b) last game replay;
c) display of machine identification (such as the identification number that uniquely identifies the machine to the local monitoring and control system); and
d) display of software or game identification (or both).

## 9.8   Demonstration mode

**9.8.1**  Demonstration mode (where implemented) may only be entered into by means of an approved secure method evaluated by the TL and approved by the GRA, and only while
a) the main door is open, and
b) the machine is on-line to a data controller unit or bank controller.

**9.8.2**  While the machine is operating in the demonstration mode, there shall be clear notification that the machine is in that mode (for example, by tower light signal or on-screen message) and the main door of the machine shall be open at all times.

**9.8.3**  If soft meters are incremented in the demonstration mode, such credits shall be automatically cancelled upon the change of the machine from demonstration mode to game-play mode.

**9.8.4**  A machine in demonstration mode shall not be capable of being used as an off-line machine. Some suggested implementations which might help prevent such illegal activity, are:
a) not to allow coins to be entered into the machine (for example, lockout) except in accordance with approved coin test procedures;
b) not to allow any coins out for credits in the machine except in accordance with approved CDD test procedures;
c) to provide a spot on a touch screen or to interpret a button that shall credit the machine with a number of coins;

d) if a "ticket" cashout is allowed, to clearly mark the ticket that is printed as a non-valid ticket, including a non-valid serial number (for example, all zeroes or nines); and

e) if the main door is closed, to let the machine immediately exit demonstration mode and return to game-play mode.

## 9.9    Idle mode

**9.9.1**    While the machine is in idle mode, if there are credits showing on the credit display, the following shall remain on view until the next play:

a) the bet display for the last play;

b) the final reel stop positions, card values, etc. for the last game play; and

c) the win display from the last play (unless a payout has occurred since completion of the last game play, and the "win" display has been used as a "collect" display).

**9.9.2**    During idle mode, if a payout has occurred since the completion of the last game play, the collect display that represents the payout shall be displayed. If multiple payouts have occurred since the last play, the collect display of the last payout only shall be displayed. Additionally, the cumulative payout amount may be displayed.

**9.9.3**    Multigame machines may have a "Game select" mode entered from "Idle" mode where the above information is not required to be displayed. If "Game select" mode is entered, it is necessary to display all of the information above when the same game is selected again (except as in 9.9.2).

## 9.10    Test/service mode

**9.10.1**    While the machine is operating in the test mode, there shall be clear notification that the machine is in that mode (for example, by tower light signal or on-screen message).

**9.10.2**    Opening the main cabinet door of the machine may automatically place the machine in a service or test-mode. A test/diagnostics mode may also be entered by means of an appropriate instruction from an attendant during an "Audit" mode access.

**9.10.3**   If there are any test-mode states which cannot be automatically cancelled by closing the door (for example, if it is first necessary to manually set a switch) or exit from the "Audit" mode (if that was the method of entry to the "Test" mode), the action necessary shall be indicated on the machine and in the relevant manuals.

**9.10.4**   Test games, if implemented, shall
a) not increment any meters, other than a temporary on-screen credit display,
b) only be available after entering a specific test game mode within door open mode, and
c) be clearly indicated as not in normal game play mode.

**9.10.5**   The following information shall be accessible in test mode if not available in audit mode
a) the revision number for the game (and if applicable, base) software in the machine;
b) set-up/configuration data; and
c) the expected RTP.

**9.10.6**   If a CDD test is implemented that does not require the door securing access to the CDD to be opened, no meters that are used to calculate revenue shall be affected.

**9.10.7**   If a "coin in" validation test is provided, the following conditions shall be met:
a) the number of coins accepted as valid by the CAD shall be displayed;
b) the number of coins that pass coin direction sensors shall be displayed; and
c) no meters shall be affected.

*NOTE Alternative implementations such as providing indicators of the line status (jammed, activated, faulty, etc.) of the validator outputs and diverter outputs are acceptable if at least the same level of diagnostics is achieved.*

**9.10.8**   Coins shall not be capable of being paid out other than:
a) by normal play, unless in CDD test mode; or

b) by a CDD dump function.

**9.10.9** If there is a possibility that credits can be obtained whilst the machine is in test mode, those credits shall be automatically cancelled when the door is closed and shall not be credited to the meters.

**9.10.10** When the machine is in test, demo or service mode, the current play-mode status of the game, including player's credit, shall be preserved.

**9.10.11** Where the possibility exists to obtain credits whilst the door is open for any purpose (for example, coin-in test) including the service mode, such credits shall be automatically cancelled when the door is closed and shall not be credited to any meters.

**9.10.12** A message or code indicating that the machine is in test, demo or service mode shall be clearly displayed.

**9.11    Power save mode**

**9.11.1** If a machine has a "Power save" mode it shall only be activated when the machine has been idle for a period of time not less than 5 min, or when the machine is in a disabled state.

For the purposes of this subclause, a machine shall be defined as being "idle" if, for the nominated duration, it
a)      does not have any key switch activated (for example, accessing "Audit" mode),
b)      does not have any door open,
c)      has no credits on the player prize display yet to be transferred to the player's credit display,
d)      has not had any coins or banknotes input,
e)      has not had its touch screen touched,
f)      has not had any button pressed,
g)      does not have any fault condition, or
h)      does not have any EFT or credit transfer to or from the machine pending.

*NOTE 1 Power save mode should be capable of being enabled or disabled by staff by means of set-up mode, or by means of the local monitoring system (if applicable).*

*NOTE 2 Power save mode may be activated manually (for example, by means of an auxiliary power switch or key switch) and in this case the conditions listed above are void.*

**9.11.2** While in "Power save" mode, power may be removed from the coin diverter, incandescent display, monitor and all fluorescent lights. Critical security functions of the machine shall still be performed.
**9.11.3** The machine shall exit from "Power save" mode and return to the normal display mode immediately upon it ceasing to be "idle" (if not using a manual power save implementation).

## 9.12    Mechanical reels and wheels

**9.12.1** Microprocessor-controlled reels (for example, stepper motor reels) shall automatically re- spin to the last legally obtained play-mode result when the play mode is re-entered (for example, when the main door is closed, power is restored, audit mode is exited, or when a fault condition is cleared).

**9.12.2**   Reel bounce and float shall be prevented when a spinning reel is being stopped.

**9.12.3**   Each microprocessor-controlled reel shall spin at least one revolution per play unless stopped by player intervention as provided for in the rules of the game.

**9.12.4**   A reel or a wheel assembly shall be so designed that the spin of each reel is not obstructed by any other component.

**9.12.5**   Microprocessor-controlled reels shall be monitored to detect malfunctions such as a reel that is jammed, or is not spinning freely, or has failed to stop, or any attempt to manipulate its final resting position.

**9.12.6**   The control of electromechanically controlled display devices, such as spinning wheels and roulette wheels, shall be sufficient to enable the system to detect a malfunction or an attempt to interfere with the correct operation of that device. This may also be achieved by a last game recall facility.

**9.12.7**   Reel assemblies shall have a clearly identifiable reference point at which the start of the strip symbol artwork is located.

**9.12.8** Reel assemblies shall be so constructed that winning symbol combinations match up with the pay lines.

**9.13    Video displays**

**9.13.1** An attract mode may be used, as long as the information required while in idle mode is displayed after the attract mode has completed its cycle.

**9.13.2** If the display is over-written by the paytable, on restoration of the game screen the same display, that shows the winning combination resulting from the last game played, shall be suitably highlighted.

**9.13.3** Screen save functions are subject to the following constraints:
a) any screen save function shall only be activated when there are no credits on the machine;
b) if a fault condition exists on the machine when the program enters the screen save function, the nature of the fault shall be displayed, otherwise the machine shall exit the screen save; and
c) the screen save mode shall cease upon the occurrence of any of the following:

       1. the activation of an input device;
       2. any door opening; or
       3. an error event condition.

**9.13.4** Touch screens, if used, shall comply with the following:
a) touch screens, which are accessed by the general public, shall be resistant to scratching from conditions likely to occur during normal use;
b) touch screens shall be accurate, and once calibrated, shall maintain that accuracy for at least the manufacturers recommended maintenance period;
c) touch screens shall be designed and installed such that static build-up is minimized to a level that ensures no humanly perceptible static is discharged through a grounded patron that touches the screen;
d) machines that employ touch screens shall have a recalibrating facility that may be either manual or automatic, but in any case shall not require access to a logic area;
e) touch screen selected input shall always be interpreted accurately and acted upon in accordance with the description of the choice (indicated on

the screen) made by the player;

f) if the opening of the machine door is found to affect touch screen calibration and recalibration is carried out with the door open, there shall be in place means to ensure that the recalibration is correct when the door is closed (for example, two sets of calibrations: one for door open and one for door closed);

g) touch screen button icons shall be sufficiently separated to reduce chances of the wrong icon being selected due to incorrect calibration or parallax errors; and

h) all buttons and touch points shall be documented.

## 9.14    Electronic funds transfer system

A machine shall retain a card used for EFT gambling within the card reading device, once inserted, except if an amount debited from the card is placed directly on the credit meter and no further transactions are required from the card (for example, updating of account balance or credit out).  The machine shall not release the card until one of the following conditions is met:

a) a player has requested a collect of remaining credits and all updating of account records or information (or both) has been successfully completed;

b) a player has a zero credit balance and all updating of account records or information (or both) has been successfully completed;

c) an invalid card event condition has been cleared; or

d) power or communications failure (except that, if conditions (a) and (b) above are met, the machine may release the card after successfully completing the updating of account records or information, or both).

## 9.15    Player input

**9.15.1**   The player's selected input shall be interpreted correctly and acted upon in accordance with the description of the choice as indicated on the labelling artwork or display.

**9.15.2**   A machine shall not be affected by the simultaneous or sequential activation of the various inputs.

**9.15.3**   In regard to multiline games, each additional line that is brought into play by the wagering of a further credit or credits shall be clearly so indicated by the game that the player is in no doubt as to which lines are in play.

**9.15.4**   In the case of multiline games, the winning play line(s) shall be clearly highlighted to the player. This may be accomplished by drawing a line over the symbols on the play line(s) or by flashing of winning symbols and line selection box (or both). Where there are wins on multiple lines, alternative indication (for example, alternate flashing of winning patterns) may be given.

## 9.16   Jackpot controllers

### 9.16.1   General requirements

Jackpots or progressive jackpots shall comply with the following:
a) the winning of the jackpot or progressive jackpot shall be determined by a machine that participates in the jackpot or progressive jackpot, and
b) the winning of the jackpot or progressive jackpot shall be based upon a random event,
c) there shall be an equally likely chance that the winning of the jackpot or progressive jackpot may occur at all times for each play of a machine that contributes to the progressive prize,
d) there shall be clear indication of which device won the jackpot or progressive jackpot in a back- to-back hit situation, and
e) if a minimum bet amount exists in order for a player to participate in a linked jackpot, then the player shall be notified accordingly.

*NOTE These requirements do not apply to mystery jackpots.*

### 9.16.2   Handling of faults

**9.16.2.1**       If a jackpot controller or a display device exhibits a fault or if communications are lost for any reason, the software shall, where possible, notify the system that monitors the jackpot controller about such interruption. This does not apply to stand-alone jackpot controllers.

**9.16.2.2**       When a controller fault occurs, it is preferred that it alternates the displays between the current amount and an appropriate fault message (this may not be applicable for purely binary coded decimal

(BCD) driven displays).

**9.16.2.3**         Provision shall be made for resolving the problem that occurs if the system determines that a jackpot has been won, but the link to the jackpot controller becomes inoperable (for example, offline jackpot).

### 9.16.3   Jackpot Display requirements

**9.16.3.1**         The jackpot or progressive jackpot value shall be accurate to one (1) cent at the time of a win, utilizing the principle of rounding up values greater than or equal to 0,5 and rounding down values less than 0,5 to the closest cent in the calculation of the value.

**9.16.3.2**         The jackpot or progressive jackpot display shall never exceed the amount accrued.

### 9.16.4   Jackpot awards

**9.16.4.1**         There shall be a clear visual indication of the winning of a jackpot or progressive jackpot on the gambling floor.

**9.16.4.2**         The progressive controller shall accommodate the situation where two jackpots are awarded "back-to-back" (that is, are awarded before the controller has reset the progressive display).

**9.16.4.3**         The jackpot system shall provide the machine that triggered the jackpot or progressive jackpot with the amount of the jackpot or progressive jackpot won.
*NOTE A jackpot may be a winning of a fixed amount or a variable amount that has been increased as a result of play on a machine or group or pool of machines.*

### 9.16.5   Controller requirements

**9.16.5.1**         Jackpot and progressive jackpots shall be monitored and controlled at all times. If the jackpot controller is a stand-alone unit, then there shall be a secure facility to access the jackpot meter information.

**9.16.5.2**         A progressive jackpot may be controlled by any of the following:
a) the game (progressive);
b) the progressive jackpot controller;
c) the jackpot server; and

d) the LMCS (*LMCS shall be also compliant with the requirements laid down in part 3 of GRA/TS-LMCS/2024*)

**9.16.5.3** When a progressive jackpot prize amount reaches a cap or ceiling value, all additional contributions shall be credited to a diversion pool that shall prevent such further contributions being absorbed into casino revenue.

**9.16.5.4** Diversion pool schemes, where a portion of the current jackpot contributions are redirected to the diversion pool so that when the current jackpot is won, this pool is added to the base (i.e. restart) value of the next jackpot, shall comply with the following requirements:
a) A jackpot redirection scheme shall not have a mathematical expectation of the value of the diversion pool to tend towards infinity.
b) Where a diversion pool is used to fund a minimum or base value, the minimum jackpot amount shall be deemed to be zero for the purposes of calculation of expected player return (i.e. in calculating player return the start-up prize can only be counted once).
c) Diversion pools shall not be capped. Contributions shall be redirected to the diversion pool when the current jackpot pool has reached its upper limit.

**9.16.5.5** Where a "master controller" employs "slave controllers" to control a linked progressive jackpot, jackpot hit events shall be time-stamped and the master controller shall ensure that
a) all slave controllers are time-synchronized, and
b) the minimum time increment is not less than the total time taken to
      1) register that a jackpot has displayed,
      2) lock up the winning device, and
      3) reset the progressive meter.

**9.16.5.6** The jackpot system shall provide the machine that triggered the jackpot or progressive jackpot with the amount of the jackpot or progressive jackpot won. This amount shall be reported to the local monitoring and control system (LMCS) by the machine or jackpot or progressive jackpot controller. The audit meters of the machine shall be updated and the machine identification shall be sent to the LMCS.

**9.16.5.7**        The progressive controller shall accommodate the situation where two jackpots are awarded "back-to-back".

**9.16.5.8**        A jackpot system shall store and maintain at least the following software meters:
a)  total amount played for jackpots;
b)  total amount of jackpots won;
c)  total jackpot contributions made, (including any diverted amounts);
d)  total jackpot contributions won;
e)  current amount for each jackpot;
f)  current value of jackpot contributions diverted;
g)  total number of jackpots won; and
h)  total diverted contributions made (reserved funding).

**9.16.5.9**        Jackpot and progressive jackpots shall be monitored and controlled at all times. If the jackpot controller is a stand-alone unit, then there shall be a secure facility to access the jackpot meter information.

**9.16.5.10**        Where a "master controller" employs "slave controllers" to control a linked progressive jackpot, jackpot hit events shall be time-stamped and the master controller shall ensure that
a)  all slave controllers are time-synchronized, and
b)  the minimum time increment is not less than the total time taken to
         a.  register that a jackpot has displayed;
         b.  Lock up the winning device; and
         c.  reset the progressive meter.


**9.16.5.11**        If a jackpot pool is discontinued, this event shall be recorded in the significant event log.

**9.16.5.12**        When a jackpot is discontinued (i.e. shutdown) the following actions are required:
a)  clear indication shall be given to players that the jackpot is not operating (for example, by displaying "Jackpot closed" on end player devices or on the jackpot display);
b)  it shall not be possible for the machine to indicate that the jackpot has been won while the jackpot is in the shutdown state;
c)  if the expected player return for non-jackpot prizes on games that

participate in this jackpot is less than the minimum RTP, for example, non-jackpot prizes equal 81 % with jackpot contributions of 10 %, then these games shall be de-activated from game play until the jackpot is re-activated;

d) activation of the jackpot from the shutdown state shall return the jackpot with the identical parameters, including jackpot value, as before the shutdown;

e) "Mystery" jackpot hidden win amounts shall be recalculated in the range current value to maximum amount when the jackpot restarts; and

f) the jackpot system shall cater for contributions made before the jackpot was discontinued, but delayed due to propagation delays, to be added to the jackpot amount.

### 9.16.6   Security of jackpot parameters

**9.16.6.1**        The method by which system jackpot parameter values are modified or entered shall be secure. Parameters to be addressed are
a) increment values,
b) secondary pool increments,
c) reset values,
d) maximum values, and
e) machines that participate.

**9.16.6.2**        If parameters are changed on a jackpot that is active, the application of these changes shall not apply until the jackpot is won other than by a full RAM reset.

**9.16.6.3**        The current jackpot amounts, including overflow meters, shall be able to be set once per RAM reset in configuration mode. The default values shall be the reset amounts and game play shall not be permitted until the current values are set to a value equal to or greater than the default value and accepted (or the default values have been accepted).

**9.16.6.4**        A jackpot that uses a hidden jackpot amount to determine the jackpot win shall not change the hidden jackpot amount when the parameters are changed if the jackpot is active (for example, had any jackpot contributions added to it).

**9.16.7 Mystery and random awards**

**9.16.7.1**            The TL shall verify that the existence or operation of a Mystery or Random award on a machine does not affect the complaint operation of that machine.

**9.16.7.2**            Where the GRA determines that a Mystery or Random Award is a Jackpot, then all the applicable clauses relating to a jackpot shall apply.

**10 Game design requirements**

**10.1 General**

**10.1.1**   Games that have a component of strategic skill (for example, draw poker and blackjack) shall comply with the following requirements:
a) the actual player return for a typical strategy, based upon the information available to the player in the game rules, shall be not less than the theoretical RTP;
b) any strategy advice or automatic holds shall be fair and not misleading to the player and shall not represent a poor choice;
c) the player shall be able to override the automatic hold; and
d) the automatic hold strategy shall be used in calculating the game's RTP.

**10.1.2**   The presentation of mapped symbols or artwork shall not alter or be modified during play, except in cases of animation during a play or as a part of the game rules, which shall be clearly described on the artwork, otherwise this constitutes a different game.

**10.1.3**   A machine shall not have any faults present, or be in any test, metering, door open or lockup mode, etc., for a game to commence.

**10.1.4**   Games that involve player physical dexterity (for example, hand/eye coordination) shall return at least the minimum RTP without adaptive strategies. For example, the size of a target area shall be independent of results previously achieved.

**10.1.5**   Credits bet may come from the credits that the player has available to bet or from the number of coins inserted.

**10.1.6**   The game may not be considered to be completed until all the appropriate meters for the game have been updated. It is permissible to update the credit meter before the completion of play provided that

critical memory is updated when the credit meter is updated.

**10.1.7**  If multigames are implemented, there shall be a method available so that it is possible to disable and enable individual games on multigame machines. If it is not possible to enable and disable an individual game, the entire machine shall be capable of being enabled or disabled.

## 10.2 Rules

A game shall follow a constant set of rules and shall at no time deviate from those rules. A rule change constitutes a different game, although variations to the maximum number of credits bet per game or lines per game (or both) are permitted. This requirement does not preclude implementations of games with multiple parts or features provided that the rules are clear to the player.

## 10.3 Game fairness objectives

**10.3.1** Each time a game element (base, primary, feature, bonus or free) is played, there shall be a chance of obtaining any of the results displayed on the appropriate paytable of that game.
**10.3.2** Events of chance within the games shall be independent of (for example, not correlated with) any other events within the game or any other events within previous games, except as provided by the rules of the game (for example, for metamorphic games).
**10.3.3** All games shall not cheat the player or be designed to give the player a false expectation of better odds by falsely representing any occurrence or event.

*NOTE   Virtual reels are acceptable.*

**10.3.4** The player shall be advised as to the frequency of the shuffling of cards (for example, by wording in the artwork or on the display screen).
**10.3.5** Game fairness objectives for games such as horse, car or animal racing, golf or football and virtual reality games shall be assessed on a case-by-case basis applying the general game fairness objectives.
**10.3.6** Capping of awards shall not be permitted.

## 10.4 Result-determination methodologies

**10.4.1**  In the case of any machine, result determination for each individual play within a game shall
a) be for all attainable combinations of the mapped symbol set (except for random awards),

b) be clearly specified on the exterior of the gambling equipment (or in a way readily available to the player and clearly apparent),

c) be a consequence of one of the result determination methodologies described in this clause,

d) have a theoretical RTP not less than that specified in legislation, and

**10.4.2**  If a game's theoretical return cannot be reasonably calculated, the manufacturer shall provide the TL with sufficient documentation that will allow the TL to determine an approximate theoretical RTP which shall be not less than the minimum RTP specified in legislation.

**10.4.3**  The minimum RTP shall be met when playing at the lowest end of a non-linear pay table (for example, if a game is continuously played at a minimum bet level for its total game cycle and the theoretical RTP is lower than the minimum RTP specified in legislation, then the game is unacceptable). This example also extends to games such as keno where the continuous playing of any spot combination results in a theoretical RTP lower than the minimum RTP specified in legislation.

**10.4.4**  If a minimum jackpot base is required to achieve the minimum RTP, as specified by the GRA, then the minimum value of the jackpot base must be recorded

a) on the test report for the machine, and

b) in the documentation /manuals.

**10.4.5**  The result in game play can be determined in the following ways:

a) pure chance;

b) pure chance plus skill where the skill element is supported by hold and selection strategies; and

c) pure chance plus skill where the skill element involves hand/eye coordination.

**10.4.6**  The machine shall not have any means of manipulation that can affect the probabilities of random event outcomes during game play.

**10.4.7**  Events of chance within games shall not be influenced, affected, controlled or determined by anything other than (in conjunction with the prevailing payout table) numerical values obtained in an RNG.

**10.4.8**  If the player's skill can influence the final outcome of the game, the game shall provide appropriate strategies for selection and holding of

elements of the game (reels, cards, etc.) which, if followed exactly, shall ensure that the theoretical minimum RTP shall be not less than that defined in the appropriate legislation.

**10.4.9** If the player's hand/eye coordination skill can influence the final outcome of the game, the pure chance of the game shall have a theoretical minimum RTP not less than that defined in the appropriate legislation and the skill element shall not cause the theoretical RTP to be reduced.

## 10.5 Game features

**10.5.1** If a feature activity is provided in which the player has to wager credits, the player shall be given a choice whether to enter the feature activity or not. A player who elects not to enter the feature activity shall be positioned at the beginning of the primary game.

**10.5.2** A game may offer random awards, provided that the award value complies with that specified by legislation.

**10.5.3** Initial entry to a feature activity shall be conditional upon an immediately preceding occurrence of a winning event in the primary game.

## 10.6 Metamorphic features

**10.6.1** Where allowed by the GRA, features that are not completely independent of play history (for example, that are metamorphic) shall
a) Display clearly to the player which game rules apply to the current game state,
b) Display to the player sufficient information to indicate the current status towards the triggering of the next metamorphosis of the game (for example, if the game collects tokens towards a feature, the number of tokens missing or the total number required to trigger the metamorphosis shall be indicated along with the number of tokens collected at that point),
c) Not adjust the likelihood of a metamorphosis occurring, based on the history of prizes obtained in previous games (for example, games shall not adapt their theoretical RTP based on past payouts), and
d) Not be misleading. If a game's metamorphosis is triggered after accruing a certain number of tokens or combination of tokens of different kinds, the probability of obtaining such tokens shall not deteriorate as the game progresses (for example, for identical tokens the last few tokens

needed shall not be more difficult to obtain than the previous tokens of that kind).

**10.6.2** The game player's return over the cycle of both the metamorphic and non-metamorphic parts of the game shall conform to the minimum RTP as specified by legislation.

**10.6.3** Any accumulated metamorphic game tokens shall not be lost during a full reconfiguration if the game that includes the tokens is still available after the full reconfiguration.

**10.6.4** If a metamorphic feature game requires extra credits to be wagered and the game accumulates all winnings (from the trigger and the feature) to a player win display (rather than directly to the player's credit display), the game shall

a)        provide a means where winnings on the player win display can be bet (by means of the credit display) to allow for instances where the player has an insufficient credit balance to complete the feature, and

b)        transfer all credits on the player win display to the player credit display upon completion of the feature.

**10.6.5** The inclusion of metamorphic features in a game shall not cause the RTP of the overall game to lessen to a value below that of the base game.

**10.6.6** If the player is allowed to wager at less than the available optimum strategy during a metamorphic game feature, the manufacturer shall provide evidence that this option shall not reduce the overall player return for that game below the minimum theoretical RTP as specified by legislation.

## 10.7 Card games

The consequences for games that depict cards being drawn from a pack are the following:

a) at the start of each game/hand, cards shall be drawn fairly from a randomly shuffled pack that consists of the full set of cards applicable to the game depicted;

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

c) the pack shall not be reshuffled except as provided by the rules of the

game depicted;

d) as cards are removed from the pack they shall be immediately used as directed by the rules of the game (for example, they shall not be discarded owing to adaptive behaviour by the machine); and

e) it is permitted to reshuffle the remainder of the deck between draws during a single game.

## 10.8 Ball-drawing games

The consequences for games that depict balls being drawn from a barrel (for example, bingo) are as follows:

a) at the start of each game, only balls applicable to the game shall be depicted;

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

c) the barrel shall not be remixed except as provided by the rules of the game depicted; and

d) as balls are drawn from the barrel, they shall be immediately used as directed by the rules of the game (for example, they shall not be discarded owing to adaptive behaviour by the machine).

## 10.9 Roulette wheel, spinning reel, dice rolling or coin tossing game

### 10.9.1 In the case of games that depict or involve either

a) the spinning of reels (such as machines or poker machines),

b) the spinning of wheels (such as roulette),

c) the rolling of dice,

d) the tossing of coins, or

e) other similar depictions.

the requirements given in 10.9.2 to 10.9.5 (inclusive) shall apply.

**10.9.2** If virtual reels that map to physical reels are used, each of the reel stops of the virtual reel strip shall have the same probability of occurring (for example, if the virtual reel consists of ″n″ positions, the probability of occurrence of each position shall be 1/n). Symbols of the virtual reel shall appear to the player in the same arrangement as the corresponding symbols of the physical reel would (for example, it shall not be possible to determine by observing the symbols displayed on the machine that the

virtual reels are used instead of physical reels). This observation extends to all symbols visible to the player. Accordingly, mapped symbols shall have identical sequences of preceding and following symbols (if these symbols are visible to the player) on both the physical and virtual reel strip.

**10.9.3** The behaviour of each reel, wheel, die or coin etc., shall be independent of (such as uncorrelated with) all other reels, wheels, dice or coins.

**10.9.4** The behaviour of each reel, wheel, die or coin etc., shall be independent of (such as uncorrelated with) its previous behaviour.

**10.9.5** For each wheel, die or coin, etc. depicted, the probability of any one face appearing shall be as for the actual physical device (for example, 1/20 for a 20 wheel; 1/6 for a six-faced die; and 1/2 for a coin).

## 10.10    Game play

### 10.10.1 Game initiation

**10.10.1.1**        A machine shall only initiate game play
a) after credits have been registered, and
b) after the player has nominated the number of credits to bet on that game,
c) after the player has pressed a "play" button (or similar input, for example, a touch screen), or
d) after the player has inserted the maximum bet.

*NOTE Where the above are combined, such as with "auto-play" buttons, or where pressing the "play" button causes a default number of credits to be selected, such facilities should be acceptable, provided that these functions are clearly explained in game instructions (for example, on button artwork).*

**10.10.1.2**        If an autoplay mode is incorporated, it shall be possible to turn this mode on or off at any time during game play.

### 10.10.2 Multigame machines

**10.10.2.1**        The methodology employed by a patron to select and

discard a particular game for play on a multigame machine shall be clearly explained to the patron on the machine and be easily followed. The machine shall clearly inform the patron of all games available at that time and offer them for selection.

**10.10.2.2** It shall not be possible to start a new game before the current play is completed and all relevant meters and displays have been updated (including features and other options of the game) unless the action to start a new game terminates the current play in an orderly manner.

**10.10.2.3** Machines that offer multiple games shall at all times indicate to the player which game has been selected for play or is being played. The player shall not be forced to play a game just by selecting that game.

**10.10.3 Tokenization**

**10.10.3.1** Devices that implement tokenization shall ensure that if a sequence of higher value coins is entered, no credits shall be lost even if there is a power failure of the gambling equipment before all of the credits are incremented to the player's balance.

**10.10.3.2** Tokenization parameters shall either be hard-coded, or be able to be configured during the configuration of the machine.

**10.11 Feature games**

10.11.1 In all cases, except for gamble features, the number of credits bet on feature games shall be added to the total bet meter regardless of whether they are bet from the credits won in the base game or not, and shall be subtracted from the player's credit display.

10.11.2 If a base game can be followed by feature games, the credits won at the end of each feature shall be added to the player's win display and to the total win meter.

**11 Artwork requirements**

**11.1 General**

**11.1.1** Unless otherwise specified in the submission documentation in

annex A and based on the functionality of the device under test for certification, Artwork, Reel Strips and Graphics, including instructions, information on the device intended to inform or guide either players or the operators, shall be evaluated and included in the test report.

**11.1.2**    This clause is mainly applicable to spinning reel games. However, some parts of this clause are also applicable to draw poker, bingo, and other game types. The rules given apply to reel strips (physical or video), belly panel and top panel artwork (physical or video implementation) and, to a limited extent, to screen/display artwork. The layout of the reels display window is not specified.

**11.1.3**    Reel strips shall have a unique part number that should also consider the position of reel position on the reel mechanism.

**11.1.4**    The manufacturer's logos or copyright messages may be visible, but in a discreet manner

**11.1.5**    By making a submission to a jurisdiction for evaluation, the manufacturer, supplier and operator of gambling equipment indemnifies the relevant jurisdiction, its duly appointed testing agents, the government of the jurisdiction and the state of any claim by any party for breach of copyright, trademark, or registered name or design, that may arise from the distribution of literature (such as rules of play) or operation of gambling equipment.

**11.1.6**    Artwork graphics shall not in any way or form be indecent or offensive.

**11.1.7**    The requirements of this clause refer to all forms of artwork (for example, anything that appears on the top panel, belly panel, buttons, on the area surrounding the display, and on the display itself). The combination of all relevant messages appearing anywhere on the artwork shall comply with these requirements.

**11.1.8**    The artwork requirements apply equally to artwork displayed in physical form and in virtual form (for example, on a video display, as a holograph image and on an liquid crystal display (LCD) or similar display.

**11.1.9**    Where both multiplier instructions and tabulated prizes are

displayed on artwork, there shall be no confusion possible as to whether the multiplier applies to the tabulated prizes or not.

**11.1.10** The outcome of each game shall be displayed for a reasonable length of time.

**11.1.11** If any game instructions are on the video screen only, they shall be accessible and visible without the need for credits to be inserted or staked. This requirement does not apply during game play except where specific instructions might be required to proceed to the next stage of the game.

**11.1.12** If the artwork contains game instructions specifying a top award, it shall be possible to win this amount from a single game (including features or other game options). For example, if the artwork states that MUR 10 000 is the top award for a game then it shall be possible to win at least  MUR 10 000 on that game.

**11.1.13** The functions of all buttons (in normal game mode) shall be clearly indicated, preferably on the button itself.

**11.1.14** Customized artwork that makes use of stickers shall use stickers that do not shrink or peel with time or heat. Where possible, stickers shall be applied on the back of the artwork glass, to avoid intentional removal. Stickers applied to other parts of the machine shall not be easily removed. Stickers shall comply with the part number requirement, however, where size limitations occur, the part number may be affixed to the sticker backing or surroundings.

**11.1.15** If different versions of the artwork require a cutout or a window (for example, a card reader), each modification shall be separately submitted for testing and certification.

**11.1.16** The name of the game being played shall be clearly visible to the player.

**11.1.17** The coin or token denomination of a machine shall be clearly visible at all times, preferably near the coin slot. If the machine uses tokens or tokenization, the number of credits registered for each token or coin respectively shall also be displayed.

**11.1.18** All game instructions shall be in English and both grammatically

and syntactically sound. Exceptions may be acceptable on a case-by-case basis.

**11.1.19** In the Western culture, the assumed direction of instructions is from left to right and from top to bottom. These directions shall be used as much as possible. Considerable breach of this common rule shall make the artwork unsuitable.

**11.1.20** All game instructions on the artwork shall be easily interpreted, clearly visible, not ambiguous, and sufficient to explain all game rules. Common sense rules shall apply. Game play and device usage instructions shall be stated unambiguously and shall not be misleading to the player.

**11.1.21** There shall be sufficient game instructions to allow a player to determine the correctness of prizes awarded. If random prizes are offered the maximum value obtainable from the random prize shall be indicated. If the value of the random prize depends on credits wagered this shall be stated.

**11.1.22** All statements on the artwork shall be true. The pay scale on the artwork shall correspond to the pay scale used in the mathematical treatise as submitted to the TL.

**11.1.23** The display of the result of a game outcome shall not be misleading or deceptive to the player (for example, it shall not improperly indicate a near miss). Where symbols appear on a pay line, these shall be clearly bisected by the pay line.

**11.1.24** Initial player selection options shall be described (for example, the selection of a runner in a horse race shall identify name, number and expected payout).

**11.1.25** Player selection options available once the game has commenced shall be clearly shown on the screen.

**11.1.26** The winning amount for each separate wager and total winning amount shall be displayed on the screen.

**11.1.27** All artwork that is relevant to game play or displays information required by the player  shall be clearly marked with a part number unique to that manufacturer and with the name or logo of the manufacturer.

Successive versions of the artwork shall have different part numbers, if applicable.

**11.1.28** All occurrences of the scattered symbols shall be labelled with the word "scatters" (or an equivalent) where they appear on the artwork panel.

**11.1.29** Upon a win, all pay lines shall be clearly indicated. If it is possible to bet more than five lines, then upon a win for video machines, the pay lines shall be indicated in a manner such that all pay lines can be clearly identified by the player.

## 11.2 Game-specific artwork

### 11.2.1   Card games

In the case of card games, the following apply:

a) it shall be clearly stated if more than one deck of cards is used in the game.

b) the artwork shall clearly state if the rules of the game do not shuffle the deck after every game. In this instance, the artwork shall indicate when shuffles actually do occur.

c) as a minimum, the player shall be able to view a tabulated display of the paytable that shows all winning hands and their payouts when no game is in progress.

### 11.2.2   Blackjack

In the case of blackjack, the following apply

a) Insurance rules shall be clearly explained if insurance is available.

b) Pair-split rules shall be explained. Areas to be addressed are the following:

      1. split aces have only one card dealt to each ace, if this is the game rule;

      2. further splits, if available; and

      3. double-down after splits; if available.

c) Double-down rules shall be clearly explained including limitations of which totals may allow a double-down to be selected.

d) The current total of all hands, including the dealer's total, shall be

displayed during and at the end of the game. The term "Bust" or the equivalent may be used to indicate a hand whose total has exceeded 21

e) Dealer play rules shall be clearly explained including special treatment of a soft 17 count, if any.

f) Any limits on the number of cards that may be drawn by player or dealer (or both) shall be explained including winners declared (if any) when the limit is reached (for example, five under wins).

g) Surrender rules shall be explained, if any exist.

h) If the player loses on "dealer push", this shall be clearly explained.

i) Deal rules used shall be clearly explained.

j) Winning hands shall be clearly labelled as to the win category, for example, "blackjack", "six under" or "push".

k) If pair splits have occurred, the results for each hand shall be shown (total points, resultant win or loss category, amount won, amount wagered).

l) Special rules, if any, shall be clearly explained.

m) All player options that are available at any point in time shall be shown on the artwork.

### 11.2.3  Poker

In the case of poker, the following apply:

a) The artwork shall provide clear indication if stud poker rules apply. Draw poker is assumed if nothing is stated.

b) The artwork shall provide a definition of winning combinations outside the scope of standard poker, for example, royal flush without wild cards, four of a kind, "jacks or better", and four deuces (when deuces are wild).

c) Wild card rules shall be clearly explained, for example, jokers wild or deuces wild.

d) Held and non-held cards, including recommended holds (if implemented) in draw poker or the equivalents shall be clearly marked on the screen, and the method for changing holds clearly displayed to the player.

e) Winning hands shall be clearly labelled as to the win category, for example, "full house".

f) All special rules outside the scope of common poker shall be clearly explained.

g) When player options outside the scope of common poker are currently available, they shall be clearly explained on the artwork.

### 11.2.4 Simulated races

This sub-clause refers to games with simulated races with animals (for example, horses), vehicles (for example, motor bikes) and humans (for example, 100 m dash), etc. The following apply:

a) all participants in the race shall have characteristics that make the participants unique in appearance (for example, numbers, jockey colours).

b) the result of the race shall be clearly obvious and not open to misinterpretation.

c) if prizes are to be paid for combinations that involve runners other than just the first place finisher, the order of the place getters that can be involved with these prizes shall be clearly shown on the screen (for example, result 8-4-7).

d) each meaningful result position shall be available for display in all last game replays.

e) the rules for alternative wagering options, for example, quinella, and the expected payouts shall be clearly explained on the artwork.

### 11.2.5 Scratch tickets

This sub-clause refers to games that simulate lottery scratch tickets or similar and the following apply:

a) a precise definition of which player options shall be taken to complete the game shall be shown on the artwork.

b) details of how payouts are won and their amounts shall be shown on the artwork, for example, three matching scratched symbols win that prize.

c) all rules for symbols that may substitute in winning patterns shall be displayed on the artwork.

### 11.2.6 Roulette

If standard roulette is simulated, the following rules apply (variations shall be considered on a case- by-case basis).

a) Each "zero" used shall be uniquely labelled (for example, "0", "00", "000").

b) The simulated roulette wheel shall be in the identical format as a standard casino wheel (including colours of landing locations and positions of numbers) with the exception of the position of "zeroes" if more than one exist, in which case the "zeroes" may be placed arbitrarily.

c) A scorecard or description of all available wagers and their payouts shall be accessible by the player while not in game play.

d) The method of selecting individual wagers shall be explained by the artwork.

e) The wager(s) already selected by the player shall be displayed on the screen.

f) The simulated ball spin shall result in a location that unambiguously determines the winning number.

### 11.2.7   Dice

This sub-clause refers to standard dice games. Variations shall be considered on a case-by-case basis. The following apply.

a) Each face shall clearly show the number of spots.

b) A simulated die shall be of the same layout as a standard die (for example, the 1 and 6, 2 and 5, and 3 and 4, respectively, shall be on opposite faces)

c) It shall be obvious, after each die has been thrown, which side is face up.

d) The result of each die shall be clearly visible or displayed.

e) There shall be a description of each wagering option available on the artwork. For example, the craps wagers "field" and "hardway" shall be clearly explained.

f) All possible wagering options available and obtainable at any point in time shall be displayed on the artwork.

### 11.3 Awards layout

**11.3.1**   The awards for the winning combinations of each symbol shall be placed in an area that visually belongs to the symbol. This can be achieved with appropriate boxing. The symbol shall preferably be placed on the left-hand side of the award scale.

**11.3.2**   The number of symbols that is required to appear in the reels display window in order to trigger each award, shall be indicated. These numbers shall line up with the awards in order to avoid any ambiguity as to which award corresponds to which number. The use of pointers is also encouraged.

**11.3.3**  If some symbols share the same pay scale, they shall be placed in an area that visually belongs to the pay scale. This may be achieved with appropriate framing or boxing. The group of symbols shall be associated with its award, and shall not invade the area that visually belongs to some other group of symbols if this could cause ambiguities.

**11.3.4**  If the awards for multiple credits staked are tabulated, the number of credits bet required for each award shall be placed above (preferably) or underneath the awards' scale. Each such number shall have associated with it the word "credits" or an equivalent. Common tabulations shall display the number of credits bet as column headings and the number of symbols required as row headings.

**11.3.5**  Games that can be tokenized shall have all award references in credits and not in coins.

**11.3.6**  The nature of all awards shall be clearly indicated. If some awards are in cash whilst others are in credits, this shall be stated.

**11.4 Positioning, size, colour and shape of symbols**

**11.4.1**  If game instructions refer to a particular symbol, preference shall be given to the use of the actual symbol rather than a description of the symbol. For example, game instructions such as "when a pair of sunglasses occurs " shall become "when <sunglasses symbol> occurs".

**11.4.2**  Game instructions that belong to only one symbol or to a group of symbols shall be clearly associated with the symbol or group of symbols. This may be achieved with appropriate framing or boxing. Additional wording such as "these symbols" may also be used.

**11.4.3**  Symbols that are not characters or numbers shall maintain the same shape throughout all artwork.

**11.4.4**  Game instructions shall be printed in a colour that contrasts with the background colour. For example, red print on a black background is hard to read for some people, and is not acceptable.

**11.4.5**  Game instructions that refer to all symbols or awards shall read "all" (or an equivalent). If some symbols or awards are excluded from these instructions, this shall be indicated with wording such as "except" (or an equivalent).

## 11.5  Winning patterns

**11.5.1**   This sub-clause refers to spinning reel variations with draw poker characteristics where the player may hold one or more reels for a second chance to improve the hand. The artwork shall address the following:
a) held and non-held reels, including recommended reels, shall be clearly marked on the screen at all times;
b) the method for changing holds shall be clearly displayed to the player;
c) if the player is required to wager additional credits to participate in the hold reels phase of the game, this shall be stated; and
d) display that the player is able to hold or release reels.

**11.5.2**   All winning combinations relevant to the particular point in time of a game shall either be clearly displayed or shall be accessible. All non-defined combinations are assumed to be non- winning.

**11.5.3**   The trigger combination(s) and all other conditions that have to occur in order to trigger a feature, shall be specified unambiguously. The action of the game when feature trigger patterns occur during the feature (for example, free games) shall be clearly stated on the artwork (for example, further triggers, bonus payout or no further trigger (or both)).

**11.5.4** If generic winning patterns (for example, graphical representation of how the symbols of the same kind might appear) are only represented graphically without the aid of an explanation, they shall be supplemented with numbers that indicate to how many correct symbols each pattern corresponds. An exception to this requirement is the case of unusual winning patterns (for example, X_X_x_X_X), where numbers shall not be displayed and the pattern shall be positioned in proximity to the prize.

**11.5.5**   Winning patterns that are not "left to right" or "right to left" or "any", shall be clearly explained, preferably with pictorial representations.

**11.5.6**   If it is possible to bet on multiple possible lines and it is not clearly obvious which reel positions are part of each of the possible lines, the additional lines shall be clearly displayed on the artwork, and appropriately labelled. The additional lines shall either be shown on static artwork or be available for display on a help or paytable screen or

permanently displayed on all game play screens in a location separate from the actual reels. This requirement applies to all standard five- reel games where lines greater than five shall be schematized on the artwork and appropriately labelled.

**11.5.7** This sub-clause refers to games, such as keno and bingo, where balls are drawn from a simulated cage or equivalent and a player tries to pick in advance which of these balls are selected. The following apply.
a) The player shall be able to view or access a tabulated display of the scorecard that shows all winning payouts when no game is in progress.
b) Any special rules that are outside the standard games of keno shall be clearly explained.
c) All of the player's selections shall be clearly identified on the screen.
d) The balls drawn shall be clearly identified on the screen.
e) The game shall highlight balls drawn that match the player's selections (such as "hits").
f) Special hits, if any, shall be clearly identified.
g) The screen shall provide clear indication of how many balls were selected and how many hits occurred.
h) Rules for purchase of additional features of the game, if any, shall be explained.
i) The artwork shall clearly state how the player makes or changes selections. Areas to be addressed are
>  1. how individual numbers are picked,
>  2. how individual numbers are cleared, and
>  3. how all selections are cleared.

**11.5.8** The artwork shall explain all rules relative to free games. The following areas relative to free games shall be addressed, in addition to the general requirements in 11.5.7.
a) Additional payouts for non-winners during the free game sequences, if any, shall be displayed on the artwork. A clear indication shall be given whether this payout is multiplied by credits staked per line or the total credits staked.
b) Any multipliers for prizes, special prizes, substitutes and other special rules during free games, shall be displayed on the artwork.
c) A clear display of an accumulated win amount is required during each stage of the free games if the machine does not directly add wins to the credit meter.
d) If more than one free game is offered, the number of free games that has occurred or the number that remains (or the total number) shall be

displayed.

e) Appropriate game instructions shall define the number of possible lines and credits per line that are wagered during the free games.

**11.5.9** The prizes for the winning patterns of each symbol shall be placed in an area that visually belongs to the symbol. This can be achieved with appropriate boxing or framing. The symbol or group of symbols shall be associated with its prize, and shall not invade the area that visually belongs to some other group of symbols if this could cause ambiguities. The number of symbols required to appear in the reels display window, in order to trigger each prize, shall be indicated. These numbers shall line up with the prizes in order to avoid any ambiguity as to which prize corresponds to which number.

**11.5.10** Card faces shall clearly display the card value (for example, it shall be obvious which is a jack and which is a queen). Card faces shall clearly indicate the suite. The colour of the hearts and diamonds suites shall be red, clubs and spades shall be black. Jokers shall be easily distinguishable from all other cards.

**11.5.11** This sub-clause refers to metamorphic games where the player still "pays" for the sequence game(s). The following apply.

a) All instructions for the game including the differences between the main game and the metamorphic game shall be stated (for example, <character> that appears anywhere in the window pays the original prize, which started the feature).

b) There shall be a statement that the number of lines or number of credits wagered (or both) during the metamorphic sequence shall not exceed the wager of the game or games that triggered the feature, if that is the rule of the feature.

c) Any special prizes, substitutes, multipliers or similar rules during the metamorphic sequence shall be clearly stated on the artwork.

d) If the metamorphic sequence consist of more than one feature game, the number of games in the metamorphic sequence that have occurred or the number that remains (or the total number) shall be displayed.

**11.5.12** This sub-clause refers to games where one or more bonus prizes might be paid to the player during the feature sequence. Generally, bonus prizes are awarded as a result of some second (or subsequent) screen animation. The following apply.

a) Criteria for entry to further bonus features as well as the initial entry shall be clearly stated.

b) All instructions and player choices for the bonus feature shall be clearly stated.

c) A display of total amounts won shall be available at the end of each stage of the game including on second screen animations. This shall include a display of bonus prizes won to date in multiple sequence bonus features.

d) If bonus prizes are multiplied, the artwork shall clearly state whether they are multiplied by credits staked per line or total, where appropriate.

**11.5.13** The artwork shall appropriately state that all wins occur on selected lit lines (and "except scatters", if applicable) or equivalent.

**11.5.14** The following requirements apply for artwork for games where one or more reels are automatically "held" for one or more "re-spins".

a) The rules for the criteria for the re-spin and which reel positions are held shall be clear and without possible misinterpretation. Examples of areas that shall be addressed are:

    1. which reels shall be held, for example, first two reels;

    2. whether held reels occur on winning or non-winning patterns;

    3. the specific line where the trigger combination shall occur, if any (for example, "on the centre line"), or scattered if that is the actual requirement of the game; and

    4. if a partial number of reels (for example, 2, 3 or 4 reels) are held for some criteria, it shall be clearly stated what happens when the criteria form part of a larger pattern (for example, what happens when all 5 reels comply with said requirement).

b) If the trigger is a winning pattern and the pattern does not pay during re-spins, this shall be clearly stated on the artwork.

c) The rules for extensions or termination of the re-spin sequences including additional held reels, for example, improvements to the original held combination(s), shall be clearly explained on the artwork.

**11.5.15** In the case of games with rules that allow for the accumulation of tokens to qualify for a feature or multiple feature to be triggered or for game metamorphosis, the artwork shall clearly show

a) the definition of the event that leads to the accumulation of tokens,

b) description of how many tokens are accumulated with each occurrence of the event,

c) a description of how many tokens are required to trigger the feature,

d) an indication of how many tokens are currently accumulated,

e) if subtokens accumulate to tokens, a description of the number of subtokens needed to accumulate a token and the number of subtokens and tokens currently accumulated,

f) if the accumulation of tokens lead to free games, the number of possible lines and credits per line that shall be wagered during the free games, and

g) game rules when further tokens are not accumulated during the feature sequence for events which normally would qualify to earn tokens.

**11.5.16** The winning combinations and pays for scatters shall be explicitly stated or displayed.

### 11.6    Gamble feature

**11.6.1**   All gamble feature instructions should be easily interpreted, and they should suffice to explain all rules.

**11.6.2**   The gamble feature limit (if applicable) for a particular game and the maximum number of gamble features available should be clearly stated, preferably on the video display.

*NOTE If wording exists that indicates the maximum award that can be won, it should be possible to win this award.*

**11.6.3**   When the gamble feature option is exited automatically before reaching the maximum number of gamble features available, the reason shall be clearly displayed.

**11.6.4**   All references to gamble feature shall use words (for example, "gamble feature" or "double up") which cannot be misinterpreted to indicate some other feature.

**11.6.5**   Any conditions in which the gamble feature option cannot be accessed should be specified.

**11.6.6**   If a gamble feature offers a choice of multipliers (for example, "pick a suit" which might have four outcomes), it shall be clear to the player what the range of choices or payouts are.

Once the player has selected a multiplier, it shall be clearly stated on the display which multiplier was selected.

### 11.7   Artwork wording

### 11.7.1   Conventions used in the wording

**11.7.1.1**      Regarding the following requirements for artwork, the conventions in (a) to (g) apply.

a) Some of the wording is only relevant to reel games.

b) None of the wording used in the examples given is prescriptive. Because of the large variety of statements that can be constructed, only examples of a particular kind of statement are provided. For example, if one statement includes references to scatters such as "except scatters", such references can be extended to a number of other statements. The reader is responsible for identifying such situations and constructing appropriate variations. Also, for some statements, opposite statements exist. These opposites are not specified. For example, if the instructions say "No free games can be triggered during free games", the opposite statement might read "Additional free games can be triggered during free games", and vice versa.

c) Game instructions relative to triggers of feature games are also not specified, nor are other game instructions that do not vary between different games for the same manufacturer.

d) Not all the words used during features are included, since they might only be relevant for specific games.

e) Some of these statements are very general and shall be read in conjunction with some other, more specific statements in order to describe the rules of the game accurately.

f) Combinations of many of the statements are possible, but are not discussed.

g) The symbol ″x″ or ″X″ is used to denote variables that can be symbols, numbers or letters.

**11.7.1.2**      All rules that relate to the game shall be able to be clearly displayed to the player.

**11.7.1.3**      The artwork shall clearly state the rules for payments of prizes where multiple wins are possible. The following shall be addressed:

a) A description of what patterns shall be paid when a pay line can be

interpreted to have more than one individual winning pattern.

b) Where the game supports multiple pay lines, a message that indicates wins on different pay lines are added or the equivalent shall be displayed.

c) Where the game supports scattered wins, a message that indicates that such wins are added to the pay-line wins or the equivalent, shall be displayed if this forms part of the rules of the game.

d) Treatment of coinciding scattered wins with respect to other possible scattered wins shall be clearly stated. For example, if both Pink Elephants and Red Frogs pay as scattered symbols and Purple Clovers substitute for both scattered symbols, the artwork shall state whether combinations of these scattered symbols pay all possible prizes or only the highest prize.

e) Where mixed symbol prizes are paid, the treatment of prizes that can be interpreted to be both mixed and straight winners shall be described.

**11.7.1.4**      The artwork shall state all rules relative to substitutes that participate in scattered wins.  The following shall be addressed:

a) If applicable, the artwork shall specifically state when the term "substitutes for all symbols" is used but the substitute does not participate in scattered wins (for example, <sub> substitutes for all symbols except scattered <scatter symbol>).

b) The artwork shall state payout rules for coinciding wins when there are multiple scattered win symbols and when substitutes participate, including the situation where one or more scattered symbols shall not appear.

c) The requirements in (a) and (b) above also apply to any change of substitutes, if this occurs.

**11.7.1.5**      If there is a feature where a symbol may substitute in a winning pattern when the symbol is not on a pay line, this shall be clearly specified on the artwork.

**11.7.1.6**      The artwork shall clearly state if the game provides for a change of substitutes (for example, during free games), and any special conditions that might apply.

**11.7.1.7**      If the game provides for extra pays or if multipliers apply when substitutes participate in winning patterns, a clear explanation shall

be provided.

**11.7.1.8** If the game provides for multipliers to apply when substitutes participate in winning patterns, the multiplication factor or a tabulation of all prizes with possible multipliers shall be displayed.

**11.7.1.9** If extra pays or multipliers apply when substitutes participate in winning patterns, the handling of winning patterns where multiple substitutes participate shall be clearly explained.

**11.7.1.10** A substitute symbol acts like a wild card in a card game.

**11.7.1.11** In games that permit multiple credits to be wagered on selected lit lines, the artwork shall either clearly state that the win(s) for each selected lit line shall be multiplied by the number of credits wagered on that line or show a tabulation of all possible wagers and their payouts.

### 11.7.2   Examples of general statements in artwork

**11.7.2.1** "Win XXX credits on a lit/pay line".

This indicates the maximum award that can be won for a single winning pattern. The total award awarded as a result of a play could exceed the XXX award, since a variety of awards can be won on different paylines.

**11.7.2.2** "All wins to credit meter"

All credits won are added to the credit meter.

**11.7.2.3** "Play 1 to XXX lines" or "Bet 1 to XXX credits per line" or "Play up to XXX credits" or "To start the game, press one of the XXX buttons".

The button that starts a game (bet per line button or number of lines bet button) is specified, to avoid confusion. The maximum number of credits that can be bet is also displayed.
If some of the above instructions are obvious from the artwork displayed in the button panel or video screen, some of the wording in the above statement can be omitted.

### 11.7.3  Examples of general mandatory statements

**11.7.3.1**       "Malfunction voids all pays and plays".

Credits accumulated as a result of a failure of the machine to function in the way in which it was designed and intended to function, are not valid and, therefore, shall not be paid.

**11.7.3.2**       "All wins shown in credits".

The machine only shows wins in credits.

### 11.7.4  Examples of coinciding wins statements

**11.7.4.1**       "Coinciding wins are added"

Each symbol can be used only once for interpreting individual paying patterns. When two or more paying patterns are awarded, none of the symbols can participate in both winning combinations, except when the substitute symbol substitutes multiple times (see 11.7.7.11). If a winning combination consists entirely of substituting symbols, generally only the highest award is awarded, for example, the award for the substituting symbols, or the award for the combination with the substituted symbols, whichever is the higher (except scatters). Other special cases that do not behave according to the above definition are clearly defined by additional wording.

**11.7.4.2**       "Coinciding wins on different lit/pay lines are added".

Wins that occur on each chosen line are added to the wins meter.

**11.7.4.3**       "Highest win only on each/any one lit/pay line" or "Highest win only" or "Highest pay line win only paid" or "Highest win only, except scatters".

Only the highest award is awarded on each lit line.
If scatters are added, an appropriate combination of game instructions shall be used.

### 11.7.5  Examples of statements regarding features

**11.7.5.1** "Each of the non-winning lit lines during free games pays X credits multiplied by credits staked per line, including when scattered wins occur".

Any non-winning chosen line pays X credits, including when a scattered win occurs on that chosen line.

**11.7.5.2** "Non-winning combinations that occur on centre line during free games pay X credits multiplied by the number of credits staked, including when scattered wins occur".

Any non-winning centre-line combination pays X credits, multiplied by credits staked, including the case when a scattered win occurs.

**11.7.5.3** "During free spins, the initial win is not repeated".

If the reels held during the free spins represent a winning combination and if such a combination is improved as a result of a free spin, the original combination is not paid again. Only if the initial combination is improved shall an award be paid.

**11.7.5.4** "During free games all wins are doubled".

Any win that occurs during the free games is at double the scheduled prize. If some prizes are offered only during free games, such prizes are also doubled when they occur. If prizes that are offered only during free games are already doubled, a statement excludes them from the above game instruction.

*NOTE The word "doubled" can be substituted with any other multiplier.*

**11.7.5.5** "Free games cannot be won again during the feature"

Free games can be triggered only during normal play. If a free game trigger occurs during the free game series, and a special prize is awarded in place of the series of free games, this is specified with an appropriate statement on the artwork.

*NOTE This is only one of the many statements that regulate triggers of free games. Because these rules are game specific, more cases are not discussed, but should be treated on a case-by-case basis.*

**11.7.5.6** "During free spins, the initial win is repeated each time no bigger win occurs".

If the reels held during the free spins represent a winning combination and if such a combination is not improved as a result of a free spin, the

award of the win that started the feature is awarded again.

### 11.7.6  Examples of statements regarding scatters

**11.7.6.1**          "Scattered awards added to lit lines/centre line wins" or "Scattered wins are always added to pay line wins" or "Coinciding scattered wins are added to pay line wins".

**11.7.6.2**          Scattered awards are always added to wins that occur on the chosen lines even if they occur on the same line as some other win.

*NOTE The statement "coinciding scattered wins added" is not acceptable.*

### 11.7.7  Examples of statements regarding substitutes

**11.7.7.1**          "X substitutes for A, B, C ..."

Only the symbols indicated are substituted. If more than one substitute symbol exists, the range of symbols that are substituted by each substitute is specified.

**11.7.7.2**          "Each symbol can participate only once in any pay line win".

When substitute symbols are used, to clarify the fact that the substitute symbol pays only in the highest paying pattern, wording to this effect shall be used. Also, to avoid confusion when any paying pattern is used, such wording is desirable.

**11.7.7.3**          "X substitutes for all symbols and for all scattered pays at the same time".

If a game offers two or more scattered symbols which are substituted by the symbol X, this wording explains that X substitutes up to a number of times: once in a pay line winning pattern, and once for each scattered symbol. Scattered symbols are substituted even when none of the scattered symbols appear on the display.

**11.7.7.4**          "If one or more X substitute in a winning pattern the prize for that winning pattern is doubled. Doubled prizes are shown in the coloured column."

The substitute symbol X doubles the prize of a winning pattern in which it substitutes. Prizes for winning patterns for the symbol X are not doubled as the symbol X does not substitute for itself. If the symbol X also doubles the prizes for scatters, this is indicated on the artwork with

appropriate additional wording.

**11.7.7.5**    "X substitutes for all symbols, including scatters".

The symbol X substitutes a number of times concurrently: once for any non-scattered symbol and once for a scattered symbol. If X can substitute in two different winning combinations of non- scattered symbols, it substitutes only in the highest paying one. If X substitutes several times on each line, including for non-scattered symbols, this is stated on the artwork. The symbol X always substitutes for scatters even if no scattered symbols are displayed. If X is substituting, it does not pay for its own winning combinations, except when it is substituting for scatters.

**11.7.7.6**    "X substitutes for all symbols [Optional: Including or Except Scatters]".

The symbol X may substitute in any winning pattern in replacement for a symbol required by that pattern (for example, queen/substitute/queen, the substitute qualifies as a queen to make three queens). Unless the optional "except scatters", or the equivalent, is used, the substitute participates in scattered wins. Further qualification may be required to clarify circumstances of games with coinciding wins rules.

**11.7.7.7**    "X substitutes for all symbols except A, B, C ...".

The symbol X substitutes for every symbol except the symbols as indicated. If more than one substitute symbol exists, the range of symbols that are excluded by each substitute is specified.

**11.7.7.8**    "Every X that substitutes in a win combination multiplies the award for that combination by XX".

The award of the combinations is multiplied by XX for each substituting symbol.

**11.7.7.9**    "If one or more X substitute in a win combination, the award for that combination is doubled. Doubled awards are shown in the coloured column".

The substitute symbol X doubles the award of a combination in which it substitutes. Awards for winning combinations for the symbol X are not doubled because the symbol X does not substitute for itself. If the symbol X also doubles the awards for scatters, this is indicated on the artwork.

**11.7.7.10**    "X substitutes for all symbols, including centre line and

both scattered pays all at the same time" or "X substitutes for all symbols and both centre line and scattered pays at the same time".

If a game offers two scattered symbols that are substituted by the symbol X, this wording explains that X substitutes up to three times: once in a centre-line combination, and once for each scattered symbol. Scattered symbols are substituted even when none of the scattered symbols appear on the display.

**11.7.7.11** "X substitutes for all symbols and X can be shared multiple times when substituting"

The symbol X can be used as a substitute as many times as required to complete winning combinations if at least one symbol of the winning combination is displayed. If no symbols of a winning combination other than X are displayed, then X does not substitute, but it pays for its own winning combination. If X is substituting, it does not pay for its own winning combinations, except when it is substituting for scatters. X always substitutes for scatters.

**11.7.7.12** "Every X that substitutes in a winning pattern multiplies the prize for that winning pattern by XX."

The prize of the winning pattern is multiplied by XX for each substituting symbol.

### 11.7.8  Examples of statements regarding tabulation

**11.7.8.1** "The award for one credit staked is multiplied by the number of credits staked (per line)".

If the pay scale for one credit is tabulated only for a few possible numbers of credits staked, the partial tabulation acts as the sample or guideline. To obtain an award that is not covered in the tabulation, the award for one credit staked is multiplied by the number of credits staked. Wording such as "Wins multiplied by credits staked" is not appropriate if partial tabulation exists because it does not state which awards are multiplied.

If partial tabulation exists, the artwork shall clearly indicate that the prize for one credit (or other appropriate bet) staked is multiplied by the number of credits bet (per line). Alternate game instructions shall ensure that it is not possible to incorrectly assume that the tabulated prizes are further multiplied by credits bet.

**11.7.8.2**      "Credits Bet" or "Total Credits Bet".

Used on multiline games to distinguish between total credits wagered on a game and credits bet per line.

**11.7.8.3**      "Credits bet per line"

If wins for different credits bet per line are tabulated, use of this wording as a heading of a column in the tabulation indicates that the awards are for credits bet per line.

**11.7.8.4**      "All wins multiplied by credits staked" or "All wins multiplied by credits staked per line"

This wording shall only be used if the pay scale for one credit bet is displayed and the full tabulation of the award scales for additional credits bet is not displayed. If a full award scale tabulation for any number of credits bet is already displayed, the above statement shall also say "As indicated".

**11.7.8.5**      "These wins multiplied by credits staked (per line)" or "Scattered pays are multiplied by the total number of credits staked".

The wins that visually belong to the above statement are multiplied by the number of credits staked. If some wins are excluded from the above statement, these game instructions shall be appropriately modified.

**11.7.8.6**      "Credits".

If wins are multiplied by the total number of credits staked, the heading of the columns of the tabulation indicate the number of credits required for each award.

**11.7.9   Examples of statements regarding winning lines**

**11.7.9.1**      "All wins on lit/bet lines only" (viewed in conjunction with a scatters statement).

All wins (except scatters) are paid only when the combination appears on a selected lit line.

**11.7.9.2**      "All wins on centre line, except scatters" or "Centre line pays only" (viewed in conjunction with a scatters statement) or "All wins on centre line only" (viewed in conjunction with a scatters statement).

Scattered wins can appear on any line according to the specified winning pattern. Other combinations are only paid when they appear on the centre line.

**11.7.9.3**        "Of a kind".

When many symbols share the same award scale, the wording "Of a kind" shall be positioned immediately above, beneath or beside the number of symbols required to complete a winning combination. The wording "Of a kind" is preferable to "Of a kind pays", to avoid a possible misinterpretation of an award with the numbers that indicate the winning pattern.

**11.7.9.4**        "All pays left to right only, including scatters".

For example, for a five-reel machine, all awards are awarded for combinations of one, two, three or four of a kind from left to right, or for five of a kind.

**11.7.9.5**        "All pays left to right or right to left (or both), including scatters".

Awards may be awarded for combinations of one, two, three or four of a kind in a sequence from either side, or for five of a kind.

**11.7.9.6**        "All pays left to right, except scatters".

The winning patterns for scatters are specified separately.

**11.7.9.7**        "All pays left to right and right to left, except scatters".

The winning patterns for scatters are specified separately.

**11.7.9.8**        "Mixed:<symbol X> or <symbol Y> or <symbol Z> mixed".

Any combination of the symbols X, Y, Z that appear on the pay line (or scattered if the symbols are scatters) and according to the specified paying pattern shall win the indicated award.

*NOTE This is defined as occurring when two or more winning patterns of a distinct kind are displayed.*

If prizes can be awarded for mixed or grouped symbols, the artwork shall clearly specify the grouping of the symbols either by placing the symbols

in an area that clearly belongs to the pay scale and labelled with the term "mixed" (or the equivalent) or by using a descriptive term that clearly defines the grouping.

**11.7.9.9** "All pays for two or more adjacent symbols, except scatters".

The winning patterns for scatters are specified separately.

**11.7.9.10** "All pays for two or more adjacent symbols, including scatters"

Awards may be awarded for combinations of two, three or four of a kind beside each other on a line, or for five of a kind on a line.

## 12 Significant event requirements

### 12.1 General

**12.1.1** The machine shall be programmed to create the event response internally, pass it to the local server of the system as soon as possible and, where required, deactivate game play.

**12.1.2** This clause provides a summary of the significant events. In the case of each significant event, the type of event (relative to requirements for deactivation and reactivation) is indicated. Each of the significant events shall be tested during the formal acceptance tests. In the following list, four types of significant event are defined:
a) type 1: information only (no deactivation);
b) type 2: events that lead to automatic deactivation but also allow for immediate automatic reactivation when the problem is solved (for example, authorized door open);
c) type 3: events that lead to automatic deactivation and require manual reactivation; and
d) type 4: events that lead to automatic deactivation and require manual reactivation, but only after the GRA audit procedures have been followed. These procedures might involve immediate approval for reactivation, or the approval could be withheld until physical inspection by the GRA inspector is completed.

To some significant events a suffix "/R" is appended, which means that the event has to be reported by the system in the daily Type 4 Events Report. Note that not all events with this description are type 4 events. By definition, all type 4 events shall be reported.

*NOTE The phrase "manual reactivation" is understood to include closing of the logic door (if necessary) or turning of a reset key.*

**12.1.3**  Significant events other than type 1 that occur on a machine shall cause a clearly displayed message that an event has occurred and, unless otherwise indicated, shall also result in the following:
a) all player inputs shall be disabled, including coin and banknote input;
b) an identifiable alarm shall be activated, which may be either a tower light or a sound of at least 1,5 s duration (or both);
c) any game result shall be saved; the reels or video display shall not display a false game outcome; and
d) if the machine was in CDD payout, the CDD shall be turned off and the brake applied.

**12.1.4**  The following actions shall be performed, if possible, on clearing of the fault on a machine:
a) any messages shall be removed
b) any relevant player inputs shall be re-enabled;
c) the alarm shall be turned off; and
d) any game play when the fault event occurred shall recommence from the beginning of the play or from the point at which the interruption occurred and conclude normally, using the data that were saved previously.

**12.1.5**  Generic significant events are applicable to all machines controlled by the system. All generic significant events shall be detected and notified as soon as possible, but before any game can be played.

**12.1.6**  All machine fault conditions shall activate an alarm, which shall include either a tower light or sound (or both).

**12.1.7**  To assist with service and fault diagnosis, the nature of the event shall be displayed.

**12.2    Machine/Terminal events**

### 12.2.1 Configuration change (type 4)

*Change of denomination, switches or jumpers, etc.*

The machine shall detect and report any configuration changes made to the device (even if the power is off when this occurs or the machine is not able to communicate with the system) and pass it to the system before game play is reactivated.

*NOTE 1 It is acceptable if the machine only detects the changes when restarting.*

*NOTE 2 Reportable changes include any change to any configuration that alters the metering or the game outcome or the RTP of the game. Examples of non-reportable changes might include the volume, or a setting which may enable or disable a peripheral, or the visual aesthetics of the machine.*

### 12.2.2 Master reset (type 3)

Intentional memory clear of the RAM and other volatile memory of a machine has occurred.

### 12.2.3 Error detected in volatile memory (type 3)

*Failure of internal test.*

The failure of some test(s) means that the machine cannot function correctly, in which case it shall disable itself immediately after reporting the event to the local monitoring and control system (if possible).

### 12.2.4 Logic area access (type 4)

*Opening of the logic area door.*

The machine shall detect the opening of the logic area door (or access to the logic area).

### 12.2.5 Logic area closed (type 1)

A sensor registers that a logic door has been closed.

### 12.2.6 Power on (type 1)

*AC power is applied to the device and power is successfully restored and the device can operate.*

### 12.2.7  Power off (type 1)

*AC power is removed from the device. Power is not successfully restored and the device cannot operate.*

### 12.2.8  Enter test/audit mode (type 2)

If the machine has a test mode or special staff/audit mode, a significant event shall be signalled when such mode is entered.

### 12.2.9  Exit test/audit mode (type 2)

If the machine has a test mode or special staff/audit mode, a significant event shall be signalled when such mode is exited.

### 12.2.10 "Coin in tilt" or "Coin out tilt" (type 2)

Sensors in the coin path shall indicate when a coin is jamming the path.

### 12.2.11 CDD empty/malfunction (type 2)

### 12.2.12 "CDD runaway", "coin out tilt" or "extra coin(s) paid" (type 2)

One or more coins are improperly paid by the CDD.

### 12.2.13 General enclosure access (type 2)

*Opening of outer enclosure door, excluding the drop box door.*

This message shall be sent by the machine if it has noticed any interference, such as the changing of counters or insertion of coins, while this door is open. When the message is sent, the local monitoring and control system shall add the staff card number to the event message. If no card number is available, the message shall be tagged as an unauthorized access by the local monitoring and control system.

### 12.2.14 Drop box door open (type 1)

*Opening of drop box door.*

When the message is sent, the local monitoring and control system shall add the staff card number to the event message. If no card number is available, the message shall be tagged by the local monitoring and control system as an unauthorized access.

### 12.2.15 Enclosure door closed (type 2)

A sensor registers that a door has been closed.

### 12.2.16 Cancel credit (type 2)

Any incident of a manual cancel credit (for example, due to book/hand pay) shall indicate a significant event. The value of the credits shall be included in the significant event report.

### 12.2.17 Low memory back-up battery (type 4)

The voltage that is produced by the battery or another device for maintaining the contents of RAM is approaching a level below which the memory cannot be maintained for a minimum of 72 h without mains power and data might be lost or corrupted.

### 12.2.18 Coin interference (type 2/R)

*External interference with a coin/token acceptor or validator.*

This refers to coin yo-yo, stringing, etc.

### 12.2.19 Reel error (type 2)

A reel position does not agree with software control.

### 12.2.20 Software validation or signature failure (type 3)

It is assumed that modification or unauthorized reading (or both) of the contents of the restricted components of the machine or loading of unapproved software (or both) could have occurred.

The machine shall be manually reactivated, after the GRA audit procedures (if any) are satisfied.

*NOTE Equipment in a casino environment does not need to be capable of doing signature checking in response to a request from the LMCS.*

### 12.2.21 Enter Demonstration Mode (type 2/R)

Where demonstration mode is permitted by the legislation, and the machine enters this mode, it shall create and transmit a type 2/R event.

### 12.2.22 Exit Demonstration Mode (type 2/R)

Where demonstration mode is permitted by legislation, and the machine exits this mode, it shall create and transmit a type 2/R event.

### 12.2.23 Printer failure (type 2)

The software shall register and react to any printer fault conditions, and shall allow the machine to complete the printing of the current ticket, if possible, and then pause printing and display an appropriate on-screen message until the problem has been solved and rectified.

### 12.2.24  Communication failure (type 2/R)

Failure of communication link between machine and the next point in the local monitoring system.

Failure is defined as the inability to send messages to or, where applicable, to receive messages from the local monitoring and control system.

### 12.3 Player/staff cards

### 12.3.1  Unauthorized card (type 1/R)

*Use of a stolen or unauthorized staff machine card or player card.*

The machine card reader shall not accept an illicit card or a card that is not authorized for use at that specific time.

### 12.3.2  Unauthorized staff PIN (type 1/R)

*Incorrect PIN entered three times consecutively with a staff machine card.*

The system shall ensure that the card is blocked from any further use.

*NOTE It is not necessary to disable the machine or the player interface.*

### 12.3.3  Unauthorized player PIN (type 1)
*Incorrect PIN entered three times consecutively with a player card.* The system shall ensure that the card is blocked from any further use.
*NOTE It is not necessary to disable the machine or the player interface.*
## 13      Connection with the Central Electronic Control System for Machines (CEMS Machines)

### 13.1 Interfacing Component

**13.1.1.** Each machine shall be equipped with an interfacing Component which may include a G2S Converter Board and/or Software. The Converter Board must be located either inside the logic area or outside the logic area in a separately installed converter board housing with separately lockable door.

**13.1.2.** The converter board will cater for following scenarios:
  1.     G2S machines
  2.     Multiple Legacy Gaming protocols including SAS.

### 13.2 Network and communication

The IPv4 Network addressing scheme is assumed as a basis for the bi-directional communication between the CEMS-machine and the machines.

Communication between the machine and the CEMS-machine shall be end to end encrypted with a level no less than 256 bit AES or other comparable method. The encryption mechanism may use a fixed or a dynamic key.

The machine or its built-in converter board shall use the IGSA G2S protocol for the communication with the CEMS-Machine. All the G2S Classes needed to cover the requirements laid down in this regulation must be fully supported.

The machine Operator is responsible to ensure that its machine or its built-in converter board is sending gaming data to the CEMS-machine using G2S Protocol.

### 13.3 Data transfer

The machine or its built-in converter board shall have the capability of automatically and continuously transferring all mandatory data to the CEMS-machine:

a) auditing meters,

b) transactions,

c) significant events,

d) progressive jackpot information including Hit, display value per jackpot instance, jackpot meters per participating machine,

e) control information about the machines and its built-in converter board (authentication as required by regulatory bodies). Each machine must be identifiable through unique serial number and identification number that uniquely identifies the machine to the CEMS-machine

f) player tracking information (such as identity of the player, time and money spent at a machine), and

g) system security and management data, including time synchronization data are communicated from the machine to the CEMS-machine and is available for the specified accounting and reporting periods.

*NOTE Data transfer to be transferred can be subject of modification if required by the MRA and the technical specifications of the CEMS-machine*

**14      Roulette wheels (applicable to Live Roulette machines only)**
NOTE This section outlines the specific requirements for roulette wheels however all requirements in this part of GRA/TS-GM/2024 should be met when applicable. Automated roulette wheels where the result is determined by a software RNG are not in scope for this section

**14.1      General requirements**

**14.1.1**   All components of the roulette wheel shall be manufactured from material that excludes the possibility of the outcome of the wheel being affected by magnets or magnetic fields.

**14.1.2**   The bowl liner shall be manufactured as a solid piece of material.

**14.1.3**   When conducting tests for randomness, the unique identifiers of the following components shall be recorded together with the results of the test:
a)      cylinder bowl;
b)      cylinder; and
c)      spindle shaft.
A test for randomness shall be conducted after any of these components are changed.

**14.1.4**   It shall be possible to check the alignment of the cylinder bowl by resting a spirit level across the bowl from rim to rim.

**14.1.5**   The coloured inserts in pockets shall not be loose.

**14.1.6**   The cylinder shall be slightly below the level of the bowl in order to ensure after the ball moves into this zone, it is deflected inward, towards the cylinder. This height shall be adjustable.

**14.1.7** The period required for the roulette wheel to slow down to a standstill shall be not less than 5 min when it is given an initial rotational speed at which the appearance of the numbers just becomes blurred.
NOTE The requirement for the period required for the wheel to slow to a standstill does not preclude the use of electrically driven wheels, provided that they comply with the requirements of 14.1.7.

## 14.2 Requirements for randomness

### 14.2.1 Conformance requirements
The results obtained from the roulette wheel shall be randomly distributed and shall be without patterns or clustering. Conformance to these requirements shall be demonstrated by compliance with, at least, 14.1.2, 14.1.3 and 14.1.4.

### 14.2.2 Sampling procedure
Sample of results shall be taken by recording the results obtained from the roulette wheel operated under the normal conditions experienced during game play (that is, the cylinder shall be given an initial rotational speed at which the appearance of the numbers just become blurred and the ball shall be released in the opposite direction at a speed that ensures that it will make at least three complete circuits of the bowl before falling into the hazards). A number of samples, not less than 1 110, shall be recorded and, when subjected to the tests in 14.1.3 and 14.1.4, shall indicate an absence of non-randomness.

### 14.2.3 Test for evidence of non-randomness
The Chi-square test shall be applied to the sample of results obtained in 14.1.2 and shall return a result of there being a 1 % or less likelihood that any observed non-randomness in the outcomes could have occurred by chance.

### 14.2.4 Test for clustering of outcomes ("Bias" or "Patterns")
A Runs test (the Geary test) shall be applied to the same set of sample values obtained in 14.1.2 and shall return a result that indicates a 1 % or

less likelihood that any observed clustering could have occurred by chance. This result shall also be expressed as a z value.

## 15 Client-server game system

NOTE This section outlines the specific requirements for CSS however all requirements in this part of GRA/TS-GM/2024 should be met when applicable

### 15.1 General requirements

#### 15.1.1 Requirements for the games

**15.1.1.1** Games offered for play shall comply with the relevant requirements of, but references into reportable events occurring on a Machine (e.g. configuration changes) are understood to also refer to such events occurring on or at the server.

**15.1.1.2** Configuration or parameter changes to games shall not occur while play is in progress. Play shall be deemed to have stopped when there are no credits on the credit meter and where either a cash-out has occurred or there has been no play for at least three minutes.

#### 15.1.2 Time stamping

**15.1.2.1** All game results, messages, significant events or player-related information (if applicable) transmitted on the system shall be suitably time stamped in the following 24-hour format i.e. dd.mm.yyyy:hh:mm:ss.

### 15.2 Software requirements

#### 15.2.1 Logical security

**15.2.1.1** The operating system of the computer(s) and applications running thereon shall provide for multi-level password security.

**15.2.1.2** All devices connected to the systems (including operator terminals) shall provide security against illegal or unauthorized access.

**15.2.1.3** All programs and important data files shall only be accessible by means of passwords.

**15.2.1.4** All PINs and passwords in the system shall be stored in an encrypted, non-reversible form.

**15.2.1.5** Use of the system for development or testing shall be completely logically separated from the live system and its database.

**15.2.1.6** A program shall be available that will list all registered users on the system, including their privilege level.

**15.2.1.7** All data sent over the network shall be encrypted by an algorithm similar to those defined in ISO/IEC 18033, Information Technology – Security techniques – Encryption algorithms (four parts).

**15.2.2 Changes to parameters**

**15.2.2.1** All changes to system parameters or data shall be identifiable.

**15.2.2.2** An audit trail of changes to gambling parameters shall be maintained by the system for not less that one year, and shall be accessible on demand by authorised personnel.

**15.2.3 Reporting capabilities**

The following data shall be reported to the LMCS:
a) financial information of all gambling activity (including jackpot transactions) conducted by the gambling server (if separate to the LMCS);

b) significant events; and

c) total of turnover and total wins for each game offered and the number of games played in order to verify the achieved gross RTP for each game available on the gambling server.

### 15.2.4  Data recovery

**15.2.4.1**          In the event of a failure, the server shall be able to recover all critical data from the time of the last backup to the point in time at which the failure occurred.

NOTE It is acceptable if this cannot be done automatically by the server but requires manual intervention.

**15.2.4.2**          The server shall have sufficient disaster recovery capability to ensure that player entitlements are protected and are able to be audited up to the point when the disaster occurred. It is acceptable to back up data to a "mirror" drive provided that the "mirror" is not on the same physical server and is not supplied from the same power supply. If necessary, this shall be provided by means of an uninterruptible power supply or similar separate power supply.

### 15.2.5  Recovery from master resets

**15.2.5.1**          The system shall be able to identify and properly handle the situation where master resets have occurred on other computer systems that might affect game outcome, win amounts or metering.

**15.2.5.2**          The system shall be able to retrieve the last valid value of all important parameters stored within the system before the master reset occurred.

**15.2.5.3**          There shall be a method where manual entry of lost parameters is entered from data manually collected in order to reconcile lost parameter information.

**15.2.5.4**          Adjustments to data on the system are to be subject to strict security control and an audit trail.

### 15.2.6 Downloadable software and games

**15.2.6.1** Downloadable software and games are permitted provided that the following security issues are satisfactorily addressed:
a) downloads are to be conducted only by an authorized;
b) downloads conducted during operational periods shall be performed in a manner which will not affect game play on other Machines;
c) for any individual machine, games shall not be playable on more than one game configuration in any one "business day" unless separate metering for each configuration is maintained;
d) a secure protocol for the download shall be used. In this context, a secure protocol means one that will deliver the download data without alteration or modification even if errors occur during the communication processes;
e) the success of an attempted download shall be verified at completion of download by checking all full configuration data;
f) the machines shall either maintain a copy of the master meter set and critical data against which integrity can be checked after the download or shall have their critical memory cleared after successful download to reset the meters;
g) any loss of power or communication that occurs during a download shall either result in the recommencement or continuation of the download and shall not require intervention by an operator; and
h) there must be a means to perform error-checking on components of a download, for example, blocks of program data, and any components that contain errors when received shall be properly resent.

**15.2.6.2** The server shall permanently log each instance of the downloading of software or games. Each log record shall contain, as a minimum:
a) the time and date of the initiation of the download;
b) the time and date of the completion of the download;
c) the Machines to which software or games were downloaded;
d) the version(s) of software or games that were downloaded.
e) the user who initiated the download; and
f) the outcome of the security check at the end of the download, for example, success or failure of the download.

## SECOND SCHEDULE
[Regulations 4, and 9(1)]

Technical Standards for Server
(Ref: GRA/TS-LMCS/2024)

### Introduction

These technical standards are supplementary to and are not intended to derogate from any provisions in the Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations. In the event of any inconsistency, the provisions in Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations shall apply

The intention of GRA/TS-LMCS/2024 is to place sufficient controls on software and operations on the server referred to under Section 28(5) of the Gambling Regulatory Act to ensure that wagering is fair, safe, secure, reliable and auditable.

It is not the intention of GRA/TS-LMCS/2024 to unreasonably

a)      mandate a single solution or method of realizing an objective,
b)      limit technology application of software,
c)      limit creativity and variety of choice,
d)      limit marketability, or

e)       advantage any supplier or manufacturer of
 software.


Alternative implementations to the requirements
contained in GRA/TS-LMCS/2024 will be considered on
a case-by-case basis by the GRA.

Situations or considerations that arise from evaluation of
systems, which have not been addressed in this
document (for example, owing to omissions or the use of
new technology), will be resolved at the discretion of the
GRA.

CONTENTS

## 1   Scope

GRA/TS-LMCS/2024 specifies the general hardware and software requirements and the list of significant events required by the Mauritius Gambling regulatory authority (GRA) for a local monitoring and control system.

## 2   General notes

*NOTE 1 There might be additional requirements for components of the LMCS that are built into another device. For example, there are requirements for electromagnetic interference (EMI) in GRA/TS-GM/2024 that affect interface cards or player tracking units in a gaming machine (GM), amongst other criteria.*

*NOTE 2 If the LMCS has jackpot controller functionality it shall meet the applicable jackpot controller requirements found in GRA/TS-GM/2024*

*NOTE 3 for the purpose of this standard, "machine" refers to gaming machines, limited payout machines or any machine used for gambling activities that is required by legislation to be connected to a local monitoring and control system*

## 3   Definitions and abbreviations

For the purposes of this document, the following definitions and abbreviations apply.

### 3.1   Definitions

#### 3.1.1.
**banknote acceptor**
bill acceptor bill validator note acceptor
device that is fitted with photo-optic and other sensors
(internal or external to the device) and that is used to
accept and validate paper or plastic legal tender or
coupons.

*NOTE Where reference is made to a "Bill acceptor
system", this is intended to include all bill handling
components, whereas "Bill validator system" refers to the
validator unit and its sub-components, excluding other
parts of the handling system.*

#### 3.1.2.
**bet**
**means:**
a) stake, or stake on behalf of another person; or
b) expressly or impliedly, undertake, promise or agree
to stake on behalf of another person, any money or
money's worth on any event or contingency.

#### 3.1.3.
**cash**
a) means money, in notes or coins, of Mauritius or in any
other currency; and
b) includes any cheque which is neither crossed nor made
payable to order, whether in Mauritius currency or in any
other currency;

**3.1.4.**
**critical data**
data contained in critical memory as follows:
a) all audit metering required;
b) machine or game configuration data (or both);
c) information that pertains to the last five games (including the current game, if incomplete);
d) software state (the last normal state the machine software was in before interruption);
e) current credits; and
f) information regarding any significant events.

**3.1.5.**
**critical memory**
memory locations for storing critical data

**3.1.6.**
**electronic funds transfer**
advanced funds transfer
system whereby credits are transferred to or from a by any means other than coins, tokens or banknotes

**3.1.7.**
**equipment**
any hardware, software, firmware, flashware or any combination in whole or in part of these intended for use in gambling.

**3.1.8.**
**error event**
set of operational conditions for a machine that constitutes a deviation from the normal behaviour or the parameters

specified during a game, during idle mode or during data interchange with another machine

### 3.1.9.
**game**
combination of events, including player interaction with the machine, that determine what prize may eventually be won from an amount staked or bet by the player

*NOTE 1 Definitions of "game" in legislation take precedence over this definition.*

*NOTE 2 The game commences when the player makes a bet from the player's credit meter that is not part of any previous game, or inserts one or more coins or any form of wager and game play is initiated.*

*NOTE 3 The game is considered completed when the player cannot continue play activity without committing additional credits from the credit meter or CAD, and has no credits at risk.*

*NOTE 4 The following elements are all considered to form part of a single game, in*
*other words, the game is not considered to have been completed until no more elements are available for play:*
*a)       games that trigger a free game feature and any subsequent free games;*
*b)       features occurring or triggered in a single game;*
*c)       "second screen" bonus feature(s);*
*d)       games with player choice (for example, draw poker or blackjack);*

*e)* *games where the rules permit wagering of additional credits, for example, blackjack insurance or the second part of a two-part keno game; and*

*f)* *gamble feature (for example, double-up).*

*NOTE 5 The game is not considered to be completed until all the appropriate meters for the game have been updated.*

### 3.1.10
**gaming machine**
a) means an electro-mechanical or other device which, on insertion of a coin, bank note, electronic credit, token or similar object or on payment of any other consideration, is available to be played or operated and the playing or operation of which, by reason of the skill of the player or operator or through an element of chance or both, may deliver, or entitle the person playing or operating the machine, or any other person, to receive cash, cheques, credit, electronic credits, debits, tokens, tickets or prizes; and
b) includes a machine:
  i. which produces a random combination of symbols on reels; or
  ii. on which a player is able to play roulette, bingo, 21, blackjack, chemin de fer, baccarat, poker, Chinese roulette, keno or on horse racing or games of similar type,
  iii. but does not include an amusement machine or limited payout machine;

**3.1.11**
**Inspector**
means a person employed as such by the Authority under section 14 (1) of the Gambling Regulatory Authority Act; and includes

i.     any person authorised in writing by the Chief Executive under section 14(2) of the Gambling Regulatory Authority Act; and
ii. the Director-General or any officer under the Mauritius Revenue Authority Act, authorised in writing by the Director-General to act as inspector

**3.1.12**
**jackpot**
award, in excess of the maximum prize as specified on a game's paytable, that is available to be won by a player as a result of activity on a machine

**3.1.13**
**legislation**
national legislation that deals with gambling, wagering, betting or horse-racing and any regulation or rule made in terms of such Act

**3.1.14**
**limited payout machine**
means:
a)     an electromechanical machine;
b)     a virtual, multiplayer station or stand-alone roulette machine;
c)     or any other device,

which complies with such technical standards as the Board may approve and which, on insertion of a coin, bank note, player card, electronic credit, token, or similar object or on payment of any other consideration, enables a person to play a game approved by the Authority, whereby the person, by reason of skill, or through an element of chance or both, receives electronic credits, tokens, jackpots or tickets that are exchangeable in return for prizes and that are limited to:

   i.one opportunity or more to play a further game;
  ii.electronic credits, tokens, jackpots or tickets for one or more cash prizes with a combined retail monetary value not exceeding MUR 10,000 or such other amount as may be prescribed; or
 iii.cash equivalent to the amount that the person inserts in the machine; "limited payout machine operator" means a person licensed to operate a limited payout machine;

### 3.1.15
**local server**
computer(s) of a local monitoring and control system on which the software is loaded.

*NOTE The primary databases in which gambling information and critical data are stored are considered to form part of the system.*

### 3.1.16
**master reset**
intentional memory clear of the random access memory (RAM) and other volatile memory of a machine RAM

**3.1.17**
**memory**
locations within the machine for storing electronic data, and the data stored therein

**3.1.18**
**Local Monitoring and Control System**
local server, data controller unit, bank controller and communications interface to each gaming machine and the connections between them located at such place designated by the operator.

**3.1.19**
**period meter**
soft meter
meter implemented in software that is used in a similar way to the odometer (for example, "trip meter") on a car

*NOTE This meter is used to record meter values since a given event (for example, coins and bills in since the last clearance).*

**3.1.20**
**progressive jackpot**
additional variable award (additional to the game's paytable) available to be won by a player as a result of an event on a machine

*NOTE The progressive jackpot starts at the base value and is incremented by a nominated amount based on*

*activity on the machine(s) connected to the progressive jackpot equipment.*

### 3.1.21
**significant event**

set of operational conditions to be recorded by the local monitoring and control system for machine(s) during a game, during idle mode or during data interchange with another machine

### 3.1.22
**site data logger**

on-site or intermediate data collector for a local monitoring and control system

*NOTE Includes data collection units contained within, or as part of, machine(s).*

### 3.1.23
**test laboratory TL**

laboratory whose test results are accepted by the GRA

## 3.2   Abbreviations

| ARQ | automatic retry query |
|-----|----------------------|
| GRA | Mauritius Gambling Regulatory Authority |
| CAD | coin acceptance device |
| CDD | coin dispensing device |
| CPU | Central processing unit |
| CRC | cyclic redundancy check |
| EMC | electromagnetic compatibility |

| EPROM | erasable programmable read-only memory |
|-------|------------------------------------------|
| ESD | Electro-Static Discharge |
| I/O | input/output |
| LAN | local area network |
| MAC | message authentication code |
| MUT | Mauritius time |
| LMCS | local monitoring and control system |
| NAK | negative acknowledgement |
| NTP | Network Time Protocol |
| PCB | printed circuit board |
| PIN | personal identification number |
| PLD | programmable logic device |
| PSTN | public switched telephone network |
| RAM | random access memory |
| RFI | Radio Frequency Interference |
| RNG | random number generator |
| ROM | read-only memory |
| RTP | return to player |
| SNTP | Simple network time protocol |
| TL | test laboratory |
| WORM | write-once read-many |

## 4    General requirements

## 4.1    Documentation

**4.1.1.** Each LMCS shall have readily available and pertinent operating and service manuals.

**4.1.2.** The operating manual shall accurately depict the use of the LMCS in its operating environment and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable the relevant personnel to understand the manual with minimal guidance.

**4.1.3.** The service manual shall accurately depict the LMCS that it is intended to cover and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable a competent person to perform repair and maintenance in a way that is conducive to the long-term reliability of the LMCS.

**4.1.4.** Documentation of the protocol shall clearly explain all messages, conventions, definitions, data formats, etc, used in that protocol.

**4.1.5.** The protocol documentation shall clearly state the data formats that shall be used for all data components used.

Examples of areas that shall be specified are:
a) byte order for data that contain more than one byte. This shall be specified as either Big Endian / Motorola / Left to Right or Little Endian / Intel / Right to Left;
b) bit order where bits are referenced. There shall be an indication whether bit numbering starts from 0 or 1 and whether it runs from left to right or right to left;
c) negative number format, where used, shall be specified (for example, ones complement, twos complement);
d) string definition shall be specified including

1) string termination indication (for example, ending null or preceding length byte),

2) string maximum lengths, and

3) padding techniques, if any, for strings less than the maximum length; and

e) special characters, including escape sequences. If used, each character or sequence

shall be clearly identified as to its function for example, formatting or font sequences).

**4.1.6.** Software documentation shall include an edit history that provides details of all changes to code (what, why, who and when).

## 4.2    Data integrity

**4.2.1.**    Any data prescribed to be transmitted to an LMCS by an associated machine shall be recorded in the database of the LMCS in a manner that accurately represents the data sent from the machine. It should not be possible to erase or alter any data in part or in whole without an error event being created and reported, and all available details of the erasure or alteration logged in an error log for manual intervention.

**4.2.2.** The minimum purpose of the LMCS is to automatically and continually gather, receive and record in an electronic format, all the required meter data and significant events data from all machine(s) attached to the LMCS. These meters and events are to be as specified in this document and as may be required by the GRA.

**4.2.3.** The data in the LMCS shall be recorded as was entered into the database

## 5 Electrical requirements

### 5.1 General requirements

**5.1.1.** All connectors and wires shall be easily identifiable (including representations in the manuals).

### 5.2 Electro-Magnetic Compatibility (EMC)

**5.2.1.** Electrical and mechanical parts and design principals of the LMCS equipment shall not subject a player to any physical hazards. The independent test laboratory does not make any finding with regard to Electro-Magnetic Compatibility (EMC), as that is the responsibility of the manufacturer of the LMCS equipment, or those that purchase it. Such 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 LMCS equipment. The independent test laboratory does not test for, is not liable for, nor makes any findings related to these matters. However, during the course of testing, the independent test laboratory shall inspect for marks, symbols or compliance reports indicating that a gaming device has undergone product safety or other similar compliance testing by some other party.

### 5.3 Electro-magnetic interference

**5.3.1.** LMCS equipment shall not create electronic noise that affects the integrity or fairness of the neighboring associated equipment

### 5.4 Electro-static interference

**5.4.1.** Protection against ESD requires that the LMCS hardware be earthed in such a way that static discharge energy shall not permanently damage or permanently impact the normal operation of the electronics or other components within the LMCS. The LMCS may exhibit temporary disruption when subjected to a significant external ESD with a severity level of 27kV air discharge but it shall exhibit a capacity to recover and complete any interrupted function without loss or corruption of any control information or critical data following any temporary disruption.

### 6 Computer and peripheral hardware requirements

### 6.1 Critical memory requirements

**6.1.1.** Manufacturers shall ensure that critical data are recorded in at least two physically separate and distinct hardware devices (which may be of the same type), either within the machine or the local data logger (or both). This critical data record shall be retained on these devices until such time that at least the following data have been successfully transmitted to the local monitoring and

control system:

a) all auditing meters;
b) current credits;
c) machine/game configuration data (for example, machine address, denomination); and
significant event information.

**6.1.2** These devices shall be capable of being reliably updated at every critical memory change.

## 6.2 Programmable logical elements (if applicable)

All programmable logic elements that incorporate read-inhibit fuses shall be programmed to prevent unauthorized reading or copying of these elements.

## 6.3 Program memory storage requirement (if applicable)

**6.3.1** All ROMs (for example, EPROMs, CD-ROMs and PLDs) shall be clearly marked to identify the software and the revision level of the data stored in the devices.

**6.3.2** All EPROMs (and PLDs that have erasure windows) shall be fitted with covers over their erasure windows.

## 6.4 Circuit boards (if applicable)
Patch wires and track cuts may be present but shall be documented in the service manual in an appropriate manner.

## 6.5 Communication

**6.5.1**     Ports for communication cabling shall be clearly and permanently labelled according to their function. [ check bullet numbering]

**6.5.2**     Ports for communication cabling (other than external ports used exclusively for auditing) shall be located within a secure area to prevent unauthorized access to the ports and to the attached cables.

**6.5.3**     Communication interfaces shall not present a hazard.

## 6.6     Video monitors and touch screens (if applicable)

Where used, video monitors shall not present a hazard.

## 6.7     Printers (if applicable)

The software shall register and react to any printer fault conditions and shall allow the machine to complete the printing of the current ticket, if possible, and then pause printing and display an appropriate on-screen message until the problem has been solved and rectified.

## 7     Software requirements

## 7.1     General

**7.1.1.**     The following shall appear in all source code modules:

a) the module name;

b) the version number;

c) the revision number; and

d) a description of functions performed.

The TL shall ensure that the program or source code modules have not been modified.

**7.1.2.** Software media shall be clearly labelled and shall contain sufficient information to identify the version and modification level. The identification used is at the discretion of the supplier but shall strictly follow the supplier's Identification system as detailed in the supplier's software configuration control procedures.

**7.1.3.** The LMCS and site data logger shall have a function or program that displays the current software version(s) installed on them.

**7.1.4.** All program source codes for site data loggers shall be made available for examination by the TL.

## 7.2      Verification of source code compilation

**7.2.1.** The party that submits software shall provide the wherewithal to demonstrate, or otherwise prove to the satisfaction of the TL, that the source code supplied compiles to the same executable code.

**7.2.2.** If redundant sections of code exist in the program, the supplier shall provide an indication of the areas of code which are redundant.

*NOTE One way of achieving this goal is to use compiler directives that omit sections of code (for example, if a particular compiler option is set or not set).*

## 7.3    Validity checks

**7.3.1.**    All devices that contain program memory or critical memory shall be validated by software.

**7.3.2.**    All non-critical memory RAM shall be checked for corruption at each power up.

**7.3.3.**    If a validity check fails, the software shall act in accordance with the requirements for error event handling (see 10.4)

## 7.4    Critical memory storage

**7.4.1.**    To cater for disruptions that occur during the update process of critical memory, at any point in time during an update there shall exist sufficient information to allow the software to fully recover from such disruptions without loss of critical data.

**7.4.2.**    The result of the critical memory validation shall be stored and kept always up to date (i.e., shall be updated after every instance of critical memory change).

**7.4.3.**    When meters in critical memory are being updated, the software shall ensure that errors in one copy of the meter readings are not propagated to other good copies.

### 7.5      Program memory storage

### 7.5.1.    Labelling

All program storage media shall be uniquely labelled, identifying the following:

a) the program name (and the software shell name, if applicable);

b) the name of the manufacturer;

c) the development number or the variation;

d) the version number;

e) the type and size of media; and (if applicable)

f) the location in the machine (if critical).

### 7.5.2.    Read/write storage

7.5.2.1 Superseded approved versions of programs may be held on the storage media. However, it shall be possible to clearly identify which files belong to which version of the program.

7.5.2.2 The method of changing to different versions of the program, including reversion to old versions, shall comply with the requirements of the GRA.

7.5.2.3 The operational software shall provide an integrity check method to verify that there are no additional or missing program or fixed data records/files on the storage device.

7.5.2.4 There shall be an ability to conduct an integrity check independent of the device's operational software to verify that there are no additional or missing program or data records/files on the storage device.

7.5.2.5 All methods of integrity checking shall have the ability to identify files/records that contain variable data and exclude them from the signature calculation.

7.5.2.6 The method of loading programs to the storage media (for example, disk file transfer or down-line load) shall comply with the requirements of the GRA.

### 7.5.3.   Flash memory devices

If the downloading of program data to reprogrammable memory program storage devices by means of the local monitoring and control system is implemented, it shall be protected from unauthorized reading, erasure or copying.

### 7.5.4.   Loading programs to flash memory devices

7.5.4.1 If the downloading of programs into a reprogrammable memory device by means of the local monitoring and control system is implemented, the method of doing so and of verifying such programs shall be subject of evaluation.

7.5.4.2 A reprogrammable memory program storage device shall be protected from unauthorized modification. Modification shall only be permitted once the TL and the GRA are satisfied with the appropriate security measures (for example, if a high-voltage chip that allows modification of the reprogrammable memory devices is installed on the printed circuit board (PCB)). The method of securing the reprogrammable storage device shall be subject of evaluation on a case-by-case basis.

7.5.4.3 Before the termination of any programming operation on reprogrammable memory, each byte programmed shall be verified by a program comparison controlled by the programming device and shall report and record the comparison results for auditing purposes.

7.5.4.4 Only the actual program and fixed data required shall be written to the reprogrammable memory device.

### 7.5.5 Write-once read-many (WORM) program storage
7.5.5.1 A WORM (for example, CD-ROM) used as a program or fixed data storage device shall be written such that only the actual program and data required are written to the WORM.

7.5.5.2 The operational software shall provide an integrity check method to verify that there are no additional or missing program or data records/files on the WORM.

7.5.5.3 There shall be an ability to conduct an integrity check independent of the device's operational software to

verify that there are no additional or missing program or data records/files on the WORM (for example, inserting a CD-ROM in another PC which then conducts a full signature check and directory search check over the CD-ROM space).

 Old approved versions of programs may be held on a WORM. However, it shall be possible to clearly identify which files belong to which version of the program.

## 8.      LMCS Functional requirements

### 8.1  Auditing information

A report shall be available that lists all the registered users on the LMCS and the privilege level of each one.

### 8.2  Cash-out by printed ticket

A ticket request shall be rejected by the system if the device that generates the ticket security feature is not able to issue such a feature and the system shall initiate the appropriate error handling procedure.

*NOTE A security feature includes any mark, attribute or element (for example, a ticket number) that is added or attached to the ticket in order to allow the ticket to be validated.*

### 8.3      Clocks

8.3.1     There shall be an internal clock in the system that reflects the current time and date. The time of the clock

shall be maintained to an accuracy better than 1,0 s over a 24 h period.

**8.3.2.**   The clock shall be used at least for the following purposes:

a) time stamping of significant events and audit meter data;

b) time stamping of player transactions such as credit transfer to/from a machine;

c) time stamping of configuration changes; and

d) ticket issuing transactions.

Time stamping shall be done at the time that the event occurred and at the time at which the event was added to the database.

**8.3.3.**   The source, for example the system or Local server, shall be able to update all clocks in intermediary devices attached to the system to a synchronisation accuracy of 500 mili-seconds per 24 h period.

**8.3.4.**   The system shall be able to update its own internal clock(s).

**8.3.5.**   If dates and times are displayed, they shall be displayed in a consistent format.

**8.3.5.1** If dates and times are displayed, they shall be displayed in a consistent in 24-hour format i.e. dd.mm.yyyy:hh:mm:ss.

*NOTE 1 This requirement does not apply to the date format on displays that are not accessible to the player, such as set-up screens.*

**8.3.6.**   Only 24-hour time formats are acceptable.

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**8.3.7.** Field separators within times shall be colons ( : ) or full stops (.). Time of day shall be given as MUT.

**8.3.8.** The LMCS shall be capable of synchronisation with a recognised Mauritius time reference, whether internal or external to the LMCS, in a secure manner and shall maintain the LMCS internal or system time to the required accuracy. The design and implementation methods of day, date and time stamping and time synchronisation and accuracy shall be confirmed by the TL. Inaccuracy or drift shall be permitted where a recorded break in communication between the source and node to be synchronised or corrected is logged. However, as soon as this communication is restored, all clocks must be synchronised and accuracy restored.

**8.3.9.** If attempts to synchronize clocks in intermediary devices attached to the system have failed three times then a significant event message shall be generated that shall include an identifier of the node, device or machine (if applicable) that failed to synchronise.

**8.3.10.** If attempts to synchronize the source, for example, the system or LMCS server, have failed three times then a significant event message shall be generated that shall include the internal clock time at which the third attempt was failed.

### 8.4 Electronic funds transactions

**8.4.1.** In a system that supports electronic funds transactions the following shall apply:
a) storage of electronic funds on the system shall be secured against invalid access or update by means of, at least, a password;
b) all electronic funds transactions shall be maintained in

a system log;

c) inactive accounts reflecting moneys held in the system shall be protected against all forms of illicit access or removal by means of, at least, a password;

d) all electronic funds transaction shall be treated as critical data to be recoverable by the system after failure;

e) all electronic funds transactions shall be correctly updated to the storage media and the system; and

f) the LMCS shall maintain a record of the EFT meter values for each EFT transaction, including any unsuccessful attempts to conduct such a transaction, for a minimum of seven days.

**8.4.2** All meters shall be recorded by the local monitoring and control system as the event occurs. Meters shall be added to by fetching of the current value from memory, conducting an arithmetic add operation and storage of the result in memory. The step-incrementing of meters to the final value over some period is not permitted.

## 8.5    Central logging of information

**8.5.1** Game play statistics, game play meter information, machine event data and machine configuration data (including configured games where applicable), as defined in the standards for the applicable machine, shall be held for each individual machine in the system for at least the current and previous year. This data may also be held in intermediate points in the local monitoring system.

**8.5.2**  Provision shall be made on the system to log all significant events.

**8.5.3**  Calculated return to player statistics for each game shall be able to be maintained for at least the current and previous year.

**8.5.4**  Where a machine is unable to operate without the loss of any information (for example, metering, transactions or significant events) it shall immediately disable any further game play.

**8.5.5**  If a significant event has not already been logged (by the system or the machine) when deactivation occurs, the machine shall ensure that such an event is reported to the system as soon as possible.

**8.5.6**  To assist with service and fault diagnosis, the nature of the event shall be displayed.

**8.6**     **Control of gambling equipment**

**8.6.1**  The LMCS shall provide an interrogation program that enables comprehensive on-line searching of the significant event log for at least the current year and the previous year. The interrogation program shall be able to do a search based at least on the following:
a) date and time range;
b) machine unique ID number;
c) venue number; and
d) significant event description(s).

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**8.6.2.** There may be a need to log onto the computer to execute external audit and interrogation programs. The password that the auditor/ Inspector uses shall give them read-only access to all data; (i.e. they shall have no ability to change anything on the production system whatsoever). However, there should be sufficient space available to enable the auditor/inspector to write a data file or report on the read- only information.

**8.6.3.** The system shall provide read-only access for the auditor to perform the following tasks, where appropriate:
a) determine operational software revision;
b) view downloadable software percentage variations and games, where applicable;
c) perform signature checks; and
d) verify that machines and other equipment are operational.

## 8.7    Backups and recovery

**8.7.1.** In the event of a failure whereby the system cannot be restarted in any other way, it shall be possible to reload the database from the last back-up point (for example, the previous night) and fully recover at least all of the following vital transactions:
a) significant events;
b) tickets generated or redeemed (or both), including current account balances;
c) account information including winnings, bets, cash deposits and cash withdrawals, PIN changes, expiry date and site where issued;
d) manual database updates;

e) operator network reconfiguration, including addition of gambling equipment, deletion of gambling equipment, modification of gambling equipment (for example, card to coin, different denominations, new games), addition of sites, deletion of sites and line swapping;
f) meter statistics; and
g) current system encryption keys.

**8.7.2.**   There shall be at least two physical copies of each data file and system database on the system.

**8.7.3.**   Backups of the system shall be able to be made on at least a daily basis. Mirrored disk copies are not adequate for these back-ups where the "mirrors" are controlled by the same CPU.

## 8.8      Encryption of stored data

**8.8.1.**   Storage of PINs or passwords (or both) on the LMCS and site data logger shall be in an encrypted, non-reversible form. A person who reads the file that stores the PIN or password data (or both), should not be able to reconstruct the PIN or password (or both) from that data, even if he/she knows the creation algorithm.

**8.8.2.**   The following information classes shall be encrypted (reversible) for storage for recovery purposes:
a) encryption/decryption keys; and
b) seed information (for signature or RNG) that is not logically stored in a password protected area of the highest access level.

**8.8.3.**   The LMCS shall be able to identify and properly handle the situation where master resets have been performed.

**8.8.4.**   The local monitoring and control system shall be able to determine the last valid meter readings that were stored within the specific machines before the master reset occurred.

**8.8.5.**   The system shall perform reasonableness checks against the meter values that were last recorded automatically in order to highlight discrepancies.

**8.9     Recording of game play statistics**

The system shall be capable of recording and storing statistics of significant events and game play activity as required by legislation (see foreword).

**8.10     Recording of significant events**

Significant events shall be automatically logged by the LMCS as they occur. The format used for the storage of the significant event data shall include the following:
a) The date and time of the event.
b) The identity of the machine that generated the event.
c) The venue number or name, in cases where the system controls multiple gambling venues.
d) A unique code that defines the event. The codes may be text or numerals and shall include a brief text that describes the event in English.

## 8.11    Security of the significant event log

The software shall resist unauthorized access to or tampering with the significant events log by at least the following strategies:

a) access to the significant events data log shall be read-only and restricted by password security;

b) the only valid method of writing to the significant events log in the software shall be output sequential, i.e. no random update methods are permitted; and

c) it is mandatory that the significant event log and software shall be so structured that it is not possible for unauthorized modifications to remain undetected.

## 8.12    Storage of the significant event log

**8.12.1.** The specific significant events, regardless of the source of these events, shall be stored in the central repository. Events may be stored temporarily at intermediate points in the system but shall be written to the central repository as soon as possible.

**8.12.2.** It shall be possible to retrieve and report events and audit meter data in the chronological occurrence order.

**8.12.3.** These events may also be stored in subsidiary points of the monitoring system (for example, machines, local controllers, remote controller and regional computers).

## 8.13    System security requirements

**8.13.1** The system and site data logger of the monitoring system shall provide for security against illegal or unauthorized access.

**8.13.2** Where PINs and passwords are used, they shall be able to be changed periodically.

**8.13.3** The machine card reader shall not accept an illicit card or a card that is not authorized for use.

## 8.14 Permitted devices

The system shall not transfer data to or gather data from any machine attached to the network unless the legitimacy of that device has been established.

*Note: The intention is to ensure that all machines enrolment to the LMCS are registered/authorised by registered user of the system.*

## 8.15 Transaction recording

The system shall record all transactions received from machines with the time and date stamp of when the event occurred in a log file(s) or database.

## 9 Communication requirements

**9.1** This clause refers to requirements and principles that apply to communication within a communication system's network. It primarily refers to communication by the LMCS or its components with a machine, but also applies to communication between other components or devices (or both) that form part of the system.

**9.2** The generic term "protocol" shall be deemed to include the hardware interface, the line discipline and the message formats of the communication.

**9.3** Where electronic data communication is used by the communication system, complete documentation of the network structure, message formats and protocols proposed shall be submitted to the TL for evaluation. The following shall apply:
a) all electronic data communication shall be protocol based and incorporate a scheme for the correction of errors;
b) all electronic data communication shall ensure that the data passed between nodes are verified for accuracy and completeness. The methodology used shall be fully documented; and
c) all electronic data communication over the public switched telephone network (PSTN), dedicated leased lines supplied by a telecommunications provider, or private lines deemed by the TL to warrant data security, shall employ encryption. The encryption algorithm shall employ variable keys.

## 10 Data communication requirements

### 10.1 Remote control of machines

Only control functions of machines that do not change

outcomes of the game may be implemented. These control functions shall be clearly specified in the protocol documentation and the machine functional specification. It shall not be possible to change the outcome of a game by means of the communication system.

## 10.2 Communications failure and recovery

All machines shall be able to handle the following range of failures without loss of data:

a) failure of central computer LAN interfaces;

b) failure of the central LAN;

c) failure of central data communication interface devices;

d) failure of single data communication interface;

e) high data communication error rates on line;

f) a foreign or additional device placed on a LAN;

g) a foreign or additional device placed between LAN bridges, communication controllers, or on data communication lines between sites;

h) single data communication port failure on remote controller (if any);

i) LAN failure on regional or local controller (if any);

j) LAN failure on cashier terminal (if any); and

k) data communication interface failure on a machine.

## 10.3 Accuracy of communications speed

Where a user/operator requires communication to be implemented, such that more than one machine may communicate using the same transmission medium, each machine shall operate at an accurate and consistent baud

rate, which shall ensure consistently accurate and error free communication (over and above the error checking and correction requirement).

## 10.4  Error detection

**10.4.1**  The low-level communication protocol shall cater for error detection and recovery equivalent to, at a minimum, a 32 bit CRC. Reliance on the error detection and correction capabilities of TCIP is not sufficient.

**10.4.2**  The data communication shall be able to withstand varying error rates from low to high. Data communication error generators might be used by the TL to verify this requirement.

**10.4.3**  All levels of the protocol shall be able to detect and discard duplicate messages unless full functionality of the communication system can be guaranteed otherwise.

**10.4.4**  Where critical data and information (for example, credits, metering information and information that pertain to a game outcome) are transferred between microcontrollers, an error check shall be done on the transferal. This check shall be at least a CRC.

*NOTE Parity checking or simple check sums are not adequate.*

**10.4.5**  Where any data (for example, credits, metering information, activation/de-activation commands, information that pertains to a game outcome and error

events) are transferred between a machine and an external device, such as components of a local monitoring and control system, an error detection and correction system shall be supported. Data errors shall be detectable to a minimum accuracy of 99,995 %.

## 10.5  Error detection and recovery

All protocols shall use communication techniques that have proper error detection and recovery functions.

*NOTE Output-only pulse based or "wiring harness" interfaces are not acceptable.*

## 10.6  Message recovery

The low-level protocol shall cater for recovery of messages when they are received in error or not received at all. The following requirements apply:

a) There shall be positive acknowledgement of all good data messages of a critical nature received;
b) If multiple messages have been sent it shall be clear which messages are being positively acknowledged;
c) Messages received in error shall initiate automatic retry query (ARQ) functions. Implementations may include negative acknowledgement (NAK) of messages received in error, window rotation schemes, timeout recovery, etc.; and
d) Secure messages (for example, credit transfer, significant events and signature results) shall not use the "broadcast" interfaces.

*NOTE The above requirements are not applicable to broadcast or unconfirmed message types.*

## 10.7  Flow control

**10.7.1**   The low-level protocol shall implement a method of flow control to enable the machine and its system/site data logger interface to slow down or temporarily halt the message flow from its partner at certain instances, unless full functionality of the communication system can be guaranteed.

**10.7.2**   Events may be queued at intermediate points of the communication system (for example, in a site data logger) or in the originating device (for example, the machine).

## 10.8  Higher level protocol

The following are characteristics that shall apply to the higher-level communication protocol:
a) there shall be no restrictions placed on characters that might be included in messages passed to or from the higher to lower level;
b) the interface shall cater for messages of variable length, including those longer than the standard buffer size of the lower level; and
c) a method of flow control shall be implemented to prevent loss of vital messages.

## 10.9  Layered protocol

**10.9.1**   The protocol shall be layered such that there are a minimum of two layers specified (i.e., low level and application level layers are a minimum requirement).

**10.9.2** Each layer shall not be dependent upon each other for recovery of errors (for example, the lowest level protocol shall not count on higher levels to resolve all communication errors).

**10.9.3** Each layer shall cater for the possible loss of messages when restarts or other such events occur from one end or the other.

## 10.10 Message authentication in low level communication

Unless full encryption is used on all messages, MACs shall be used with key message types, such as metering, to enable the communication system to determine when invalid modification to such messages has taken place. Use of MACs may be considered as an alternative to encryption for all but the most secure message types (for example, password transmission).

## 10.11 Message framing in low level communication

**10.11.1.** The low-level communication protocol shall provide a clear and precise method of framing messages so that there is no chance of a partial message being acted upon by the receiver.

**10.11.2.** If the framing method involves the use of unique starting or ending characters (or both), a method of "transparency" shall be implemented so that these characters can be sent as part of the data component of the message, and not interpreted as control characters. This

requirement applies to data and error detection sequences such as CRCs.

### 10.12 Multi-dropping

**10.12.1.** Multi-dropping capability is required for all protocols that communicate with machines except those communication systems that use a single or dedicated communication interface for each machine.

**10.12.2.** Multi-dropping of multiple machines on a single communication line is acceptable provided that

a) a unique method of identifying/addressing each legitimate component on the line is provided, either static or dynamic,

b) adequate timeout facilities are provided,

c) a method of identification and rejection of illegitimate components exists,

d) a method is present to prevent or reduce the risk of simultaneous transmissions by the multi-dropped equipment (appropriate methods are polling, collision detection with random back-off restart times, token ring, etc.),

e) the hardware interface requirements are met,

f) adequate controls exist to prevent communication stoppage due to deadlock, and

g) if the transmission speed is determined by a communication port of the device (for example, for asynchronous transmission), the protocol shall specify a maximum transmission speed (baud rate) tolerance within which devices shall operate in order to prevent deterioration of the performance of the line.

**10.13  Period meters**

If the system uses period meters (for example, for performing cash or banknote clearances), these may only be cleared after a master reset or upon activation of some planned, external intervention (for example, a drop box door open signal or a cash clearance signal).

**10.14  Software meters**

**10.14.1** The following requirements for the protocol exist for meters implemented in the software:

a) the protocol shall clearly state the method of storage for each kind of meter;

b) the protocol shall clearly state the unit of measure for each meter (for example, cents or counter); and

c) the protocol shall provide for sufficient width to ensure that no overflow can occur without its being noticed by the monitoring system.

**10.14.2** Meters forwarded by a machine shall always be reconcilable relative to the other meters. For example, this might require an appropriate locking mechanism to prevent imbalances during such events as game play, money in and money out.

**10.15  Restart or recovery of communication**

The following are requirements for the restarting or recovery of communication messages:

a) the higher-level protocol shall employ technique(s) (for example, end to end acknowledgement) such that it shall not lose messages, regardless of whether the higher or lower level restarts communication; and

b) the higher level protocol shall employ technique(s) (for example, transmission numbers), such that repeated messages are identified and discarded, even when one end or the other restarts.

*NOTE These requirements do not apply to unsecured messages (for example, broadcast messages).*

**10.16   Simulator**

If a simulator is provided to enable development of the protocol in machines and other gambling equipment that interface with the protocol and assist in the testing of the machines by other suppliers, the TL and the GRA, then the simulator shall:

a) adequately support and execute all transactions and message types that are used by the protocol;

b) have a function to thoroughly check every requirement, behaviour, function or feature the protocol dictates;

c) run on standard, freely available equipment such as a personal computer or the equivalent; alternatively, the supplier shall loan, on request, suitable hardware on which the simulator can operate to suppliers of machines; and

d) be provided, together with all relevant documentation, on request to all users.

**10.17   Data storage, Data protection and data integrity**

**10.17.1** The means of data storage shall be designed and implemented to automatically and continuously ensure that all mandatory data is stored without alteration and integrity of the data is continuously validated by the

system. The critical data referenced is as follows:

a) Metering and transactional data,

b) Significant Events,

c) Critical Data,

d) System security and system management data, including time synchronization data.

*NOTE "Qualify Time Synchronization"*

**10.17.2** The system should be able to detect and report incidents of soft meters inconsistent movement.

*Note: If the* machine *has reported a value of any meter that is lower than the previously reported meter, the system should be able to detect such behaviour and report a significant event. The system significant event should list the machine number and the values resulted to the inconsistency.*

**10.17.3** Modification of stored data received from Gaming machines is prohibited. The only method of writing data associated to the machines should only create an adjustment entry with reason for the entry, date of the entry and the name of the user who created the adjustment.

## 11      Significant events requirements

### 11.1  General

**11.1.1**   This clause provides a summary of the significant events. In the case of each significant event, the type of event (relative to requirements for deactivation and reactivation) is indicated. Each of the significant events

shall be tested during the formal acceptance tests.

In the following list, four types of significant event are defined:

a) type 1: information only (no deactivation);

b) type 2: events that lead to automatic deactivation but also allow for immediate automatic reactivation when the problem is solved (for example, authorized door open);

c) type 3: events that lead to automatic deactivation and require manual reactivation; and

d) type 4: events that lead to automatic deactivation and require manual reactivation, but only after authorization in accordance with procedures defined by the GRA.

To some significant events a suffix "/R" is appended, which means that the event has to be reported by the local monitoring and control system in the daily Type 4 Events Report. Note that not all events with this description are type 4 events. By definition, all type 4 events shall be reported.

*NOTE The phrase "manual reactivation" is understood to include closing of the logic door (if necessary) or turning of a reset key.*

**11.1.2** The below described significant events are generated by the machines, when applicable, and sent to the LMCS. The LMCS must be capable of receiving and storing them in a database(s).

## 11.2  machine/terminal events

### 11.2.1   Configuration change (type 4)

Change of denomination, switches or jumpers, etc
The machine shall detect and report any configuration changes made to the device (even if the power is off when this occurs or the machine is not able to communicate with the system) and pass it to the system before game play is reactivated.
Any deviation to the configuration should result in manual re-verification and consequent reactivation of the device.

*NOTE 1 It is acceptable if the* machine *only detects the changes when restarting.*

*NOTE 2 Reportable changes include any change to any configuration that alters the metering or the game outcome or the RTP of the game. Changes that need not be reported include, for example, the sound, the tower light, settings that might enable or disable a peripheral, or changes to the visual aesthetics of the* machine.

### 11.2.2   Master reset (type 4)

Intentional manual memory clear of all non-volatile memory of a machine has occurred.

### 11.2.3   Error detected in either volatile or non-volatile memory (type 4)

Failure of internal test.
The failure of some test(s) means that the machine cannot function correctly, in which case it shall disable itself

immediately after reporting the event to the local monitoring and control system (if possible).

Portable memory shall be treated as volatile memory and shall be stored within the logic area.

### 11.2.4  Logic area access (type 4)

*Opening of the logic area door.*
The machine shall detect the opening of the logic area door (or access to the logic area).

### 11.2.5  Logic area closed (type 1)

A sensor registers that a logic door has been closed.

### 11.2.6  Power on (type 1)

AC power is applied to the device and power is successfully restored and the device can operate.

### 11.2.7  Enter test/audit mode (type 2)

If the machine has a test mode or special staff/audit mode, a significant event shall be signaled when such mode is entered.

### 11.2.8  Exit test/audit mode (type 2)

If the machine has a test mode or special staff/audit mode, a significant event shall be signaled when such mode is exited.

### 11.2.9 "Coin in tilt" and "Coin out tilt" (type 2)

Sensors in the coin path shall indicate when a coin is jamming the path.

### 11.2.10 CDD empty/malfunction (type 2)

### 11.2.11 "CDD runaway", "coin out tilt" or "extra coin(s) paid" (type 2)

*One or more coins are improperly paid by the CDD.*

### 11.2.12 General enclosure access (type 2)

*Opening of outer enclosure door, excluding the drop box door.*

This message shall be sent by the machine if it has noticed any interference, such as the changing of counters or insertion of coins, while this door is open. When the message is sent, the local monitoring and control system shall add the staff identification to the event message. If no identification is available, the message shall be tagged as an unauthorized access by the local monitoring and control system.

### 11.2.13 Drop box door open (type 1)

*Opening of drop box door.*

When the message is sent, the local monitoring and control system shall add the staff identification to the

event message. If no identification is available, the message shall be tagged by the local monitoring and control system as an unauthorized access.

### 11.2.14 Enclosure door closed (type 2)

*A sensor registers that a door has been closed.*

### 11.2.15 Cancel credit (type 2)

Any incident of a manual cancel credit (for example, due to book/hand pay) shall indicate a significant event. The value of the credits shall be included in the significant event report.

### 11.2.16 Low memory back-up battery (type 4)

*The voltage that is produced by the battery or another device for maintaining the contents of RAM is approaching a level below which the memory cannot be maintained for a minimum of 72 h without mains power and data might be lost or corrupted.*

### 11.2.17 Coin interference (type 2/R)

*External interference with a coin/token acceptor or validator.*

This refers to coin yo-yo, stringing, etc.

### 11.2.18 Reel error (type 2)

*A reel position does not agree with software control.*

### 11.2.19 Banknote receptacle is removed (if the banknote storage area uses a receptacle) (type 2)

The machine shall automatically disable itself, after reporting the event to the local monitoring and control system.

### 11.2.20 Software validation or signature failure (type 3)

*It is assumed that modification or unauthorized reading (or both) of the contents of the restricted components of the* machine *or loading of unapproved software (or both) could have occurred.*

The machine shall be manually reactivated after the GRA audit procedures (if any) are satisfied.

*NOTE Equipment in a casino environment is not required to be capable of doing signature checking in response to a request from the LMCS.*

### 11.2.21 Enter demonstration mode (type 2/R).

Where demonstration mode is permitted by the legislation, and the machine enters this mode, it shall create and transmit a type 2/R event.

### 11.2.22 Exit demonstration mode (type 2/R)

Where demonstration mode is permitted by legislation, and the machine exits this mode, it shall create and transmit a type 2/R event.

### 11.2.23 Printer failure (type 2)

The software shall register a printer fault.

### 11.2.24 Communication failure (type 2/R)

*Failure of communication link between the machine and the next point in the monitoring system.*

Failure is defined as the inability to send messages to or, where applicable, to receive messages from the local monitoring and control system.

### 11.2.25 Failure of internal time synchronisation within the LMCS (type 2/R)

*An attempt to synchronise the time within the LMCS has failed.*

The event message includes an identifier of the node, device or machine (if applicable) that failed to synchronise.

### 11.2.26 Failure of time synchronization with the MUT reference (type 2/R)

*An attempt to synchronise the system time with the external MUT reference has failed.*

The event message includes the system time at which the attempt failed to synchronise.

### 11.2.27 EFT transfer failure to or from EGM (Type 2/R).

The actual time that the event occurred and the value of the failed transaction

### 11.2.28 Time and date inconsistencies (type 1)

When there is discrepancy between the current record's date and time stamp and the previous record's date and time stamp

### 11.3 Player/staff cards

### 11.3.1 Unauthorized staff PIN (type 1/R)

*Incorrect PIN entered three times consecutively with a staff machine card.*

The system shall ensure that the card is blocked from any further use.

*NOTE It is not necessary to disable the* machine *or the player interface.*

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### 11.3.2   Unauthorized player PIN (type 1)

*Incorrect PIN entered three times consecutively with a player card.*

The system shall ensure that the card is blocked from any further use.

*NOTE It is not necessary to disable the* machine *or the player interface.*

### 11.4   Banknote acceptance

### 11.4.1   Banknote reject state (type 1)

The machine shall report banknote reject events to the local monitoring and control system.

**11.4.2**   Banknote acceptor mechanism is disconnected (type 1).

### 11.5   Large win events

**11.5.1**   Any award, other than a progressive award, that results in the lock-up of the machine (type 3)

**11.5.2**   The value of the award shall be reported.

*NOTE It is acceptable to enter the value into the system manually.*

**11.5.3**   Progressive award or random win (type 2/R)

The value of the award shall be reported.

**11.5.4**   Progressive controller faulty or disconnected (type 2/R)

When the controller for a progressive award fails, all the relevant machines shall be disabled until the problem is rectified.

## THIRD SCHEDULE
[Regulations 6, 9(1) and 9(3)]

Technical Standards for Limited Payout Machine
(Ref: GRA/TS-LPM/2024)

**Introduction**

These technical standards are supplementary to and are not intended to derogate from any provisions in the Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations. In the event of any inconsistency, the provisions in Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations shall apply

The intention of this part of GRA/TS-LPM/2024 is to place sufficient controls on software, hardware and operations to ensure that wagering is fair, safe, secure, reliable and auditable.

It is not the intention of this part of GRA/TS-LPM/2024 to unreasonably

a)      mandate a single solution or method of realizing an objective,
b)      limit technology application of software,
c)      limit creativity and variety of choice,
d)      limit marketability, or
e)      advantage any supplier or manufacturer of software.

Alternative implementations to the requirements contained in this part of GRA/TS-LPM/2024 will be considered on a case-by-case basis by the GRA.

Situations or considerations that arise from evaluation of systems, which have not been addressed in this document (for example, owing to omissions or the **use** of new technology), will be resolved at the sole discretion of the GRA.

CONTENTS

**1      Scope**

This part of GRA/TS-LPM/2024 specifies the constructional and operational requirements for gambling equipment to be used in venues that have site licenses for limited payout machines (LPMs).

**2      General notes**

Limited payout machine connection to a Local Monitoring and Control System will be reviewed in a case by case basis and may be authorized at the sole discretion of the GRA.

**3      Definitions and abbreviations**

For the purposes of this document, the following definitions and abbreviations apply.

**3.1      Definitions**

**3.1.1**
**attract mode**
information or graphics that relate to the game or games available on that machine that the limited payout machine (LPM) may display during the LPM's idle mode

**3.1.2**
**autoplay**
facility in a LPM that automatically plays the next game following the completion of the current game

### 3.1.3
**banknote acceptor**
bill acceptor bill validator note acceptor
device that is fitted with photo-optic and other sensors (internal or external to the device) and that is used to accept and validate paper or plastic legal tender or coupons approved in that jurisdiction

*NOTE Where reference is made to a "Bill acceptor system", this is intended to include all bill handling components, whereas "Bill validator system" refers to the validator unit and its sub-components, excluding other parts of the handling system.*

### 3.1.4
**bet**
**means:**
a) stake, or stake on behalf of another person; or
b) expressly or impliedly, undertake, promise or agree to stake on behalf of another person, any money or money's worth on any event or contingency;

### 3.1.5
**capping**
truncating
situation where the amount added to the win meter from a single play within a game is less than either
the monetary or credit value for the winning combination, or
the sum of the monetary value or sum of the credit values for the winning combinations, from a single play

within a game that is displayed to the player on the paytable

### 3.1.6
**cash**
a) means money, in notes or coins, of Mauritius or in any other currency; and
b) includes any cheque which is neither crossed nor made payable to order, whether in Mauritius currency or in any other currency;

### 3.1.7
**cashout**
action initiated by a player when redeeming available credits from an LPM

*NOTE This term is used whether the LPM pays credits from the hopper, by electronic transaction or by issuing a ticket.*

### 3.1.8
**coin dispensing device dump**
hopper dump
hopper count
function in the LPM whereby the entire contents of the CDD are counted out into the coin tray without affecting the revenue calculation

### 3.1.9
**coin acceptance device**

coin input devices, together with the coin validator or comparator, photo-optic sensors (internal or external to the comparator), and any additional devices used to accept and validate a coin

**3.1.10**
**coin acceptance system**
system that comprises the coin acceptance device and the associated software required to validate the physical input of coins and the conversion of these coins into credits.

**3.1.11**
**coin dispensing device**
device, together with coin storage mechanism (for example, hopper or tubes), photo-optic and other sensors (internal or external to the device) and any other devices and pathways used to pay out coins to the player

**3.1.12**
**critical data**
data contained in critical memory as follows:
a)      all metering required by this part of GRA/TS-LPM/2024;
b)      LPM or game configuration data (or both);
c)      information that pertains to the last five games (including the current game, if incomplete);
d)      software state (the last normal state the LPM software was in before interruption);
e)      current credits; and
f)      information regarding any significant events

*NOTE   Information pertaining to the last five games is only required if applicable to that type of LPM.*

### 3.1.13
**critical memory**
memory locations for storing critical data

### 3.1.14
**electronic funds transfer**
advanced funds transfer
system whereby credits are transferred to or from a LPM by any means other than coins or tokens

### 3.1.15
**equipment**
any hardware, software, firmware, flashware or any combination in whole or in part of these intended for use in gambling

### 3.1.16
**error event**
set of operational conditions for a LPM that constitutes a deviation from the normal conditions or the conditions specified during a game, during idle mode or during data interchange with another LPM

### 3.1.17
**feature**
activity within a game triggered by an outcome within that game

*NOTE Any additional free game, free spin of certain reels, or secondary choice necessary to complete a game is considered a feature.*

**3.1.18**
**gamble feature**
feature within a game that is only entered following a win, and which involves the risking of all or part of the result of that win

*NOTE Gamble feature bets may incorporate a variety of symbols, player choices, or win chances.*

**3.1.19**
**gambling**
a)     means paying or staking consideration, directly or indirectly, on the outcome of something with a view to winning money when the outcome depends wholly or partly on chance; and
b)     includes:
  i. playing any casino game, gaming house game or on any gaming machine or limited payout machine;
  ii. pool betting; and
 iii. betting, paying, or staking consideration on the outcome of any event or contingency;

**3.1.20**
**idle mode**
state in which a LPM is powered up, but is not active in the execution of a game, a test routine, an audit, a

calibration, or a data interchange with an external device

### 3.1.21
**Inspector**
means a person employed as such by the Authority under section 14 (1) of the Gambling Regulatory Authority Act; and includes

    i.    any person authorised in writing by the Chief Executive under section 14(2) of the Gambling Regulatory Authority Act; and

    ii.   the Director-General or any officer under the Mauritius Revenue Authority Act, authorised in writing by the Director-General to act as inspector

### 3.1.22
**legislation**
Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007)

### 3.1.23
**limited payout machine**
means:

a)    an electromechanical machine;

b)    a virtual, multiplayer station or stand-alone roulette machine;

c)    or any other device,

which complies with such technical standards as the Board may approve and which, on insertion of a coin, bank note, player card, electronic credit, token, or similar object or on payment of any other consideration, enables a person to play a game

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approved by the Authority, whereby the person, by reason of skill, or through an element of chance or both, receives electronic credits, tokens, jackpots or tickets that are exchangeable in return for prizes and that are limited to:

  i. one opportunity or more to play a further game;
  ii. electronic credits, tokens, jackpots or tickets for one or more cash prizes with a combined retail monetary value not exceeding MUR 10,000 or such other amount as may be prescribed; or
  iii. cash equivalent to the amount that the person inserts in the machine; "limited payout machine operator" means a person licensed to operate a limited payout machine;

**3.1.24**
**logic area**
secure enclosure area that houses electronic components that have the potential to influence the operation of the host, the data controller unit, the bank controller or the LPM

**3.1.25**
**master reset**
intentional memory clear of the random access memory (RAM) and other volatile memory of a LPM RAM

**3.1.26**
**maximum prize**
maximum win that is permissible in terms of legislation applicable in Mauritius

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**3.1.27**
**memory**
locations within the LPM for storing electronic data, and the data stored therein

**3.1.28**
**metamorphic feature**
metamorphic game
feature of a game or series of games that is not completely independent of play history

**3.1.29**
**Local monitoring and control system**
local server, data controller unit, bank controller and communications interface to each gaming machine or LPM and the connections between them located at such place designated by the operator

**3.1.30**
**multigame**
more than one game type offered by the gambling software on a single LPM

**3.1.31**
**paytable**
list of winning combinations with their associated win amounts, rules of the game and explanations as to how a winning combination may be made up that is, or is capable of being, displayed to the player

**3.1.32**
**period meter**
soft meter
meter implemented in software that is used in a similar
way to the odometer (for example, "trip meter") on a
car

*NOTE This meter is used to record meter values since a*
*given event (for example, coins and bills in since the last*
*clearance).*

**3.1.33**
**return to player**
ratio of total winnings to the total turnover, expressed
as a percentage

**3.1.34**
**reprogrammable memory device**
type of on-chip memory storage device

**3.1.35**
**secure area**
area within a LPM that may only be accessed by
means of a key

**3.1.36**
**software shell**
base software or the operating system software in
which there is no game information

**3.1.37**
**stake**

total monetary value of all bets or wagers put at risk to play a single game

### 3.1.38
**static artwork**
artwork that is physically printed on, for example glass, plastics, and non-removable stickers, and that is displayed on the LPM to the player

### 3.1.39
**test laboratory**
laboratory whose test results are accepted by GRA

### 3.1.40
**token**
circular element with an indicated monetary value, excluding legal tender such as coins, that might be put into LPMs

### 3.1.41
**tokenization**
situation where the insertion of one coin either gives rise to more than one credit being made available to the player, or where more than one coin is required to be inserted in the CAD for the player to receive one credit

### 3.1.42
**turnover**
handle
monetary value of the total of all cash or credits (or both) staked on game play

**3.1.43**
**win**
award
prize
number of credits or monetary value awarded to the
player as a result of a winning combination or
combinations at the end of a single play within a game

**3.1.44**
**winning combination**
one or more winning patterns that result in credits
being added to the total win meter, and the win display

**3.1.45**
**winning pattern**
set of symbols that participates in a winning
combination (including substitution)

**3.1.46**
**winnings**
monetary value of the total of all coins or credits
added to the total win meter and the win display
during a game, as a result of any game outcome
according to the game rules, resulting in credits being
added to the total win meter and to the win display

**3.1.47**
**significant event**
set of operational conditions over which the LPM
shall be programmed to create an internal response
and, where required, deactivate game play.

*NOTE A LPM might display this value in credits or in monetary value.*

### 3.2 Abbreviations

| | |
|---|---|
| CAD | Coin Acceptance Device |
| CAS | Coin Acceptance System |
| CDD | Coin Dispensing Device |
| CEMS-GM | Central Electronic Monitoring System for Gaming Machines |
| CPU | Central Processing Unit |
| CRC | Cyclic Redundancy Check |
| EFT | electronic funds transfer |
| EMC | electromagnetic compatibility |
| EMI | electromagnetic interference |
| EPROM | erasable programmable read-only memory |
| ESD | Electro-Static Discharge |
| G2S | Game to System |
| GRA | Mauritius Gambling Regulatory Authority |
| I/O | input/output |
| LAN | local area network |
| LPM | limited payout machine |
| MUR | Mauritian rupees |
| MUT | Mauritius time |
| PIN | personal identification |
| PLD | programmable logic device |
| RAM | random access memory |
| RFI | Radio Frequency Interference |

| RNG | random number generator |
| --- | --- |
| ROM | read-only memory |
| RTP | return to player |
| TL | test laboratory |
| WORM | write-once read-many |

## 4      General requirements

### 4.1      Documentation

**4.1.1**      Each LPM model shall have readily available and pertinent operating and service manuals.

**4.1.2**      The operating manual shall accurately depict the use of the LPM in its operating environment, and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable the relevant personnel to understand the manual with minimal guidance.

**4.1.3**      The service manual shall accurately depict the LPM that it is intended to cover, and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable a competent person to perform repair and maintenance in a way that is conducive to the long-term reliability of the LPM.

**4.1.4**      Software documentation shall include an edit history providing details of all changes to code (what, why, who and when).

### 4.2      Enclosure construction

**4.2.1** The enclosure shall be of a sturdy construction with a locking system that resists the kind of unauthorized entry that the LPM is likely to be subjected to in a gambling venue. The enclosure shall be so designed to protect internal components from any external abuse to which the LPM is likely to be subjected in a gambling venue.

**4.2.2** Areas of the enclosure that are accessible to players and staff shall be so constructed and so finished as not to create a safety hazard or create a risk of injury.

**4.2.3** All protuberances (for example, buttons and handles) on the enclosure that are accessible to players or staff, and all attachments to the enclosure (for example, labels and identification plates) shall be sufficiently robust to prevent their unauthorized removal.

**4.2.4** Door support devices shall be of construction solid enough to prevent sagging of the door and any problems with door sensor alignment.

**4.2.5** Spilled liquid shall not be able to enter the logic area, the power supplies, or areas that contain wiring of voltage exceeding 32 V.

**4.2.6** Hinge centre pins, if used, shall not be able to be removed without leaving evidence of tampering

**4.3 Enclosure identification**

**4.3.1** The LPM shall have an identification plate made by metal or any equally resilient material, that bears the following information permanently affixed

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to the exterior of the enclosure by the manufacturer in a position that allows it to be read easily after the equipment has been installed:

a)        the name of the manufacturer;
b)        a unique serial number;
c)        Its model number ; and
d)        the date of manufacture.

**4.3.2**      The serial number shall be marked or affixed in a permanent manner onto the interior of the LPM enclosure in a position that allows it to be read easily after the equipment has been installed.

**4.3.3**      Each external key switch of the gambling equipment enclosure, switches and player buttons shall be labelled or otherwise identified in the gambling device manual, either according to its function or to the series of events initiated by its activation. If a key lock initiates some kind of user activity other than simply unlocking a door, then its function shall be labelled (for example, if a key lock turns one way to enter audit mode, and turns the opposite way to enter cancel credit mode, then both directions shall be labelled accordingly) or clearly described in the LPM manual.

*NOTE The LPM manual will contain a clear description of all external key switch functions.*

## 4.4      Enclosure security

**4.4.1**      All components of a LPM that do not form part of the player's input interface (for example, buttons) shall be stored within one or more secure areas of the LPM, with the exception of areas that have access to lighting only. Unauthorized access to a secure area by physical means shall be detectable. This requirement does not apply to areas that only provide access to lighting components, such as top boxes or belly panels.

**4.4.2** Where holes, gaps or slots exist in the exterior of a secure area, there shall be sufficient protection to ensure that the insertion of foreign objects shall not compromise the security or safety of that secure area.

**4.4.3** A secure area shall resist forced entry and shall retain evidence of attempts at such entry.

**4.4.4** Access to a locked area "A" shall not be possible from another locked area "B" without the use of a key or other secure access device for locked area "A".

## 4.5 Access detection systems

**4.5.1** All access points shall have access detection sensors.

**4.5.2** When the door of the LPM is shut, it shall not be possible to insert any object into the LPM in such a way that the access detection sensor is disabled.

**4.5.3** The access detection system shall be secure against attempts to disable it or to interfere with its normal mode of operation. Cable runs and mountings for the logic area access sensors shall be securely protected.

**4.5.4** It shall not be possible to create a false alarm door open condition (for example, by bumping the door).

**4.5.5** If the access detection system is disconnected, the gambling equipment shall interpret this action as the door having been opened.

**4.5.6** The LPM shall deactivate game play upon the opening of a door but may immediately reactivate when the door is closed, unless it has noticed the changing of counters or insertion of coins while this door is open, which is deemed to be interference and precludes automatic reactivation

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unless the LPM was placed in test mode.

## 4.6 Logic areas

**4.6.1** The following are the items of electronic componentry that shall be housed in one or more logic areas:

a) central processing units (CPUs) and other electronic components involved in the operation and calculation of game play (for example, game controller electronics, and components housing the game or system firmware program storage media);

b) electronics involved in the operation and calculation of game result determination;

c) electronics involved in the calculation of game display, and components housing display program storage media (passive display equipment exempted);

d) communication controller electronics and components housing the communication program storage media; and

e) all reprogrammable memory devices that affect the game play function of the LPM.

**4.6.2** Communication, input/output (I/O) and display interfaces that do not significantly influence the operation of the gambling device may be excluded from the logic area.

**4.6.3** Logic areas shall be fitted with access detection systems that shall enable the software to detect whether the door to the logic area is open or closed, regardless of whether the mains power is switched on or off, or whether the LPM is on-line or off-line. It shall remain able to detect this event with the mains power off for at least 24 h.

**4.6.4** If the logic door is opened more than once

while the LPM is off-line or powered off, the LPM shall, for the purposes of event reporting, treat this as a single entry.

**4.6.5** There shall be a facility for storing a logic door open event for at least 14 d.

**4.6.6** Provision shall be made on the logic door such that a physical seal can be fitted which would be broken if the logic area was accessed.

**4.6.7** It shall not be possible (without a detailed technical knowledge of the machine) to reset the logic area door open state (without detection) when the logic door is open (for example, the access detection system shall not be able to be tampered with or replaced without leaving evidence that this has occurred).

**4.6.8** It shall not be possible to insert a device into the logic area that can disable the door open sensor of the logic area when the door is shut without such act being detected or leaving evidence of tampering.

**4.6.9** If the logic area consists of a board with no door as such, as the entire board can be removed and accessed, the security requirements for the logic doors extend to logic units (i.e. removal of the board is equivalent to opening the door).

**4.6.10** It shall not be possible to reset the logic area door open state, by either hardware or software means, if the logic door is still open.

**4.6.11** If the logic area is not located inside another secure area of the LPM, it shall possess a second means of physically securing the area by a lock in addition to the provision for fitting a seal.

**4.6.12** It shall not be possible to access the data bus, address bus, or control lines of any of the circuit boards without gaining access to a logic area.

## 5      Electrical requirements

### 5.1      General Requirements

**5.1.1**     All connectors and wires shall be easily identifiable, both in the LPM itself and on the circuit diagrams in the manuals.

### 5.2      Electro-Magnetic Compatibility (EMC) and Radio Frequency Interference (RFI)

**5.2.1**     Electrical and mechanical parts and design principals of the LPM shall not subject a player to any physical hazards. The independent test laboratory does not make any findings with regard to Electro-Magnetic Compatibility (EMC) or Radio Frequency Interference (RFI), as that is the responsibility of the manufacturer of the LPM, or those that purchase it. Such EMC and RFI testing may be required under separate statute, regulation, law, or act and should be researched accordingly by those parties who manufacture or purchase said LPM. The independent test laboratory does not test for, is not liable for, nor makes any findings related to these matters. However, during the course of testing, the independent test laboratory shall inspect for marks, symbols or compliance reports indicating that a gaming device has undergone product safety or other similar compliance testing by some other party
*Note: It is the manufacturer's responsibility to submit EMC and RFI reports to the TL. These reports shall be listed in the Test Report issued by the TL*

### 5.3      Elector-Static Discharge (ESD)

**5.3.1**    The independent test laboratory shall perform certain tests to determine whether or not an Electro-Static Discharge (ESD) impacts the integrity of a gaming device. ESD testing is intended to simulate techniques observed in the field that may be used in an attempt to disrupt the integrity of electronic gaming devices.

**5.3.2**    The LPM shall comply with the following requirements related to ESD testing:
  a) The Random Number Generator (RNG) and random selection process shall be impervious to influences from ESD; and
  b)          Protection against ESD requires that the gaming device's conductive cabinet be earthed in such a way that static discharge energy shall not permanently damage or permanently impact the normal operation of the electronics or other components within the LPM. LPM's may exhibit temporary disruption when subjected to a significant external ESD with a severity level of 27kV air discharge. The LPM shall exhibit a capacity to recover and complete any interrupted play without loss or corruption of any control information or critical data following any temporary disruption.

### 5.4      Power supply

**5.4.1**    All ratings of fuses shall be clearly stated on or near the fuse holder, and switches on the power supply shall clearly indicate in a permanent manner the on and off positions.

**5.4.2**    The LPM shall be able to operate from a 230 V,

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50 Hz main power source, which might deviate 10 % above and below nominal voltage and 1 % above and below nominal frequency.

**5.4.3**    Where the LPM enclosure contains more than one power switch, each switch shall be so marked in a permanent manner to indicate clearly to which board or component it applies.

**5.4.4**    The LPM shall not be dependent on an uninterruptible power supply to meet the conformance or redundancy requirements of this standard.

## 6.    Computer and peripheral hardware requirements

### 6.1    Random access memory (RAM)

**6.1.1**    LPM RAM data storage shall be capable of reliably preserving its memory contents for at least 14 d with the mains power switched off.

**6.1.2**    It shall not be possible to reset the LPM until the battery capacity has increased above the 14 d capacity limit, either by recharging or replacement of the battery. If a rechargeable battery is used, the power source shall be capable of recharging the battery to its full capacity within 24 h.

**6.1.3**    RAM clears of the LPM shall not be possible except by accessing the logic area.

**6.1.4**    In an LPM, batteries shall be secured and

connected to the boards that contain RAM such that the batteries cannot be easily disconnected.

## 6.2      Critical memory requirements

**6.2.1**      Manufacturers shall ensure that critical data are recorded in at least two physically separate and distinct hardware devices (which may be of the same type).

**6.2.2**      These devices shall be capable of being reliably updated at every critical memory change.

## 6.3      Program memory storage requirements

**6.3.1**      All ROMs (for example, EPROMs, CD-ROMs and PLDs) shall be clearly marked to identify the software and the revision level of the information stored in the devices.

**6.3.2**      All EPROMs (and PLDs that have erasure windows) shall be fitted with covers over their erasure windows.

**6.3.3**      EPROMs that contain any settings or programs that have the potential to cause the LPM to fail to comply with this part of GRA/TS-LPM/2024 or with legislation shall not be contained within the LPM. This includes EPROMs that have a range of parameters that are used for setting up the device.

## 6.4      Programmable logical elements

All programmable logic elements that incorporate read-inhibit fuses shall be programmed to prevent unauthorized reading or copying of these elements.

## 6.5    Circuit boards

Patch wires and track cuts may be present, but shall be documented in the service manual in an appropriate manner.

## 6.6    Switches and jumpers

**6.6.1**    If switches or jumpers that have the potential to cause the LPM not to comply with this part of GRA/TS-LPM/2024, or with legislation, are present, then setting them in a manner that would result in non-compliance shall cause the LPM to enter "Tilt" mode. As long as the switch or jumper is set in this manner, it shall not be possible to reset the LPM.

**6.6.2**    All switches and jumpers that have the potential to affect the communications or operational characteristics of the LPM shall be documented for evaluation by the test laboratory.

## 6.7    Communication

**6.7.1**    Where multiple LPMs communicate over a single multi-drop transmission medium, each LPM shall operate at an accurate and consistent baud rate, which shall ensure consistently accurate and error free communication (over and above the error checking and correction requirement).

**6.7.2** Gambling equipment communication interfaces shall not present a hazard.

**6.7.3** Ports for communication cabling shall be clearly and permanently labelled according to their function.

**6.7.4** Ports for communication cabling (other than external ports used exclusively for auditing) shall be located within a secure area to prevent unauthorized access to the ports and to the attached cables.

**6.7.5** Where any data (for example, credits, metering information, activation or de-activation commands, information that pertains to a game outcome and error events) are transferred between a LPM and an external device an error detection and correction system shall be supported.

**6.7.6** The means of communication shall be designed and implemented to automatically, continuously and timeously ensure that all data is accurate and reliable.
a) The measure of accuracy shall be an error rate of 0,1 % or less.
b) The measure of reliability shall be a data failure rate of 0,1 % or less

## 6.8     Video monitors and touch screens

Where fitted, video monitors shall not present a hazard.

## 6.9     Printers (if applicable)

**6.9.1** If a LPM is equipped with a printer, the printer shall be located in a secure area other than the logic area.

**6.9.2** The printer paper shall be easily replaced without any need to access the logic area of the LPM. Instructions for the loading of printer paper shall be given in the operating manual.

**6.9.3** The software shall register and react to any printer fault conditions and shall allow the machine to complete the printing of the current ticket and then pause printing and display appropriate on-screen messages.

## 7    Transaction System Requirements

### 7.1    Coin acceptance systems

**7.1.1** Coin comparators shall be permitted in a limited payout LPM.

**7.1.2** Each coin inserted shall register the actual MUR and cents value or the number of credits on the player's credit meter or bet meter. If registered directly as credits, the conversion rate shall be clearly stated or be easily discernible from the LPM.

**7.1.3** During periods when the gambling equipment is inoperable for any reason, all coins shall either be prevented from being inserted, or be rejected.

**7.1.4** The coin input system shall have means by

which it can detect or logically deduce (or both) when potential cheating is in progress.

**7.1.5** In games where tokenization is used, each valid coin inserted shall register a number of credits that are clearly stated on the machine artwork, video or other form of information display.

**7.1.6** The coin acceptance system (CAS) shall be able to

a) not have its coin path easily altered from the outside of the LPM without leaving evidence of physical modification,

b) deliver an accepted coin to the correct area of the gambling equipment,

c) credit the customer's credit balance with the appropriate MUR and cents value or number of credits for each accepted coin, and to return all other coins to the coin tray, and

d) detect and prevent attempted fraud.

**7.1.7** The software shall direct coins to either the CDD or to the coin drop box. The "CDD full" detector shall be continually 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 after the state change without causing a disruption of coin flow, or creating a coin jam.

**7.1.8** Diverter operations shall be dependent only on CDD sensor status, not software counters. If a software counter is used, it shall be used in conjunction with a mechanical sensor, which shall override the software

counter.

**7.1.9** Coin validation shall be electronically based and be so designed as to ensure that each coin inserted and accepted as valid by the LPM is added to the credit meter and that it updates all appropriate meters.

## 7.2 Coin dispensing devices

**7.2.1** The CDD shall have detection devices to enable the LPM to interpret and act upon conditions when the CDD is empty or when the CDD malfunctions.

**7.2.2** The CDD shall be resistant to manipulation such as by the insertion of foreign objects into the output path.

**7.2.3** If a LPM can be operated with the use of coins and is fitted with a CDD, it shall be located in a suitably secured area within the LPM.

**7.2.4** If the LPM does not issue clear instructions on the steps necessary either to perform a CDD refill or to reset the fault when a "CDD jam/empty" error message or equivalent wording is displayed, then these instructions shall be clearly set out in the operator manual.

**7.2.5** If power to the CDD is removed, the CDD should not dispense extra coins. In this case if additional coins are dispensed, this shall only be acceptable as long as this extra payout is not reflected on the meters of a LPM, and therefore does not affect

the collection of taxes.

**7.2.6**     A LPM shall not permit a cashout to be performed during any of the following conditions:
   a) during game play;
   b) while the LPM is in demonstration, test or audit mode; and
   c) while the LPM is in a fault condition that requires manual activation.

*NOTE Manual reactivation implies that the LPM is reactivated for game play before the cashout is permitted.*

**7.2.7**     If the value of the prize, when added to the player's current credits, exceeds the "maximum credit" setting in the LPM, the value of the prize shall be dispensed directly from the CDD or a handpay shall be initiated.

**7.2.8**     The design and construction materials of a CDD shall be of an acceptable quality and the CDD shall require no adjustments for at least the manufacturer's recommended maintenance period.

## 7.3     Bill acceptor system

**7.3.1**     The banknote acceptor device shall perform a self-test at each power up. In the event of a self-test failure, the banknote acceptor shall automatically disable itself (i.e. enter banknote reject state) until the error state has been cleared.

**7.3.2**     If burning materials enter a banknote acceptor, the only degradation permitted is for the acceptor to

reject all banknotes. Entering a state where either incorrect banknotes are accepted, or correct banknotes are accepted but not credited to the customer, is not acceptable.

**7.3.3** If liquids are spilled into a banknote acceptor, the only degradation permitted is for the acceptor to reject all banknotes. Entering a state where either incorrect banknotes are accepted, or correct banknotes are accepted but not credited to the customer, is not acceptable.

**7.3.4** Any interconnecting cable or plug (or both) relative to the banknote acceptor shall have some form of strain relief. Knots in the cables when passing through holes in the cabinet or housing are not an acceptable means for achieving such strain relief.

**7.3.5** Interconnecting cables from the banknote acceptor device to the LPM shall not be exposed external to the LPM or readily accessible to unauthorized staff.

**7.3.6** The banknote storage area (for example, receptacle) shall be attached to the LPM in such a manner that it cannot be easily removed by physical force. It may be located within the LPM or attached to the base on which the LPM is positioned.

**7.3.7** The relevant jurisdiction may grant dispensation for this requirement if it can be demonstrated that an external banknote acceptor has at least the same degree of security as one located inside

the LPM. Areas of security that should be examined when considering such a dispensation are:

a) physical strength of the attached banknote acceptor device; and

b) position and type of fixings (for example, screws, nuts, and bolts).

**7.3.8** The designated path which banknotes traverse and associated handling devices shall be designed so that they resist jams and do not impair travel during insertion, acceptance, depositing or expulsion of banknotes.

**7.3.9** The designated path which banknotes traverse and associated handling devices shall be of solid construction.

**7.3.10** Any access to the banknote acceptor components shall disable the LPM from game play until such time as the access has been cleared.

**7.3.11** Any LPM that has both a coin and a banknote acceptor is required to include a number of security features as follows:

a) access to the coin drop box shall not give access to the banknote storage area;

b) access to the banknote storage area shall not give access to the coin drop box; and

c) the LPM shall be able to cater for simultaneous input of banknotes and coins.

*NOTE The rejection of either or both is acceptable.*

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**7.3.12** All points in the banknote path shall be easily accessible to allow for inspection and clearance by service personnel once valid access is gained to the area in which the banknote acceptor is housed. Actions intended to be carried out by persons other than licensed technicians shall not require the use of tools.

**7.3.13** The banknote acceptor shall be easily removed for inspection by service personnel.

**7.3.14** Access to banknote acceptor components and banknote storage areas shall be secured by means of key lock. Access doors for both areas shall be fitted with "door open/close" sensors (use of the main door sensor for access to banknote acceptor components is acceptable).

**7.3.15** An LPM that contains a banknote acceptor device shall maintain sufficient metering to be able to report the following:
a) the total monetary value of banknotes accepted (banknote money in);
b) the number or value of banknotes accepted for each banknote denomination; and
c) the individual MUR value of each of the last five banknotes accepted.

*NOTE These meters are master meters, i.e. to be cleared only on master reset of the LPM.*

**7.3.16** An LPM with a banknote acceptor installed shall comply with the hardware requirements of this part of GRA/TS-LPM/2024, including specifically

electrical safety and radio interference regulations. LPMs which have been previously approved to which banknote acceptors are to be added, shall be retested for compliance with these requirements. Where previous test reports have been supplied, new certification shall be obtained with an LPM submitted for test installed with the banknote acceptor and all other modifications. For example, specific tests that may require additional testing before re-certification are

a) electrostatic discharge,

b) power surges,

c) radio frequency interference, and

d) EMI.

**7.3.17**    Any access required to clear a banknote jam shall not give access to the banknote storage area, except if the jam occurs inside the banknote storage area.

**7.3.18**    The keys that open the locks on the banknote storage door shall be different from the standard outer door or banknote outer door. They may be the same as the coin drop box door keys.

**7.3.19**    The banknote acceptor device shall have a banknote storage area (for example, receptacle) full sensor. This shall be indicated on the LPM. The banknote acceptor shall disable itself when full but game play may continue.

## 7.4    Bill validator system

**7.4.1**    It shall not be possible to successfully disable

any validation feature and thus register any counterfeit banknote as a valid banknote.

**7.4.2** Acceptor devices shall incorporate sophisticated detection methods to validate banknotes by suitable evaluation methods.

**7.4.3** Banknote acceptors shall be factory set only; it shall not be possible to access or conduct maintenance or adjustments in the field, other than
a) the selection of banknotes and limits, or
b) changing of approved EPROMs or downloading of approved software.
The adjustment of the tolerance level for accepting banknotes of varying quality, or the alteration of any of the possible checking procedures is prohibited in the field. If a banknote acceptor has multiple tolerance levels, the ability to switch to lower levels shall be disabled.

**7.4.4** If the banknote acceptor only accepts banknotes in a particular direction, orientation or with a particular side facing up, there shall be sufficient instructions on the LPM artwork to clearly indicate this to the player. A label with a symbolic sign of the banknote orientation attached near the banknote entry point is considered to be the best method of complying with this requirement.

**7.4.5** The LPM may have a facility where the banknote acceptor operation can be disabled or enabled by means of an action not available to the player, for example, audit mode or LPM cabinet access. In the

instance of the banknote acceptor being disabled, the LPM can still be played using coin input.

**7.4.6** A LPM shall not register credits as the result of banknote input until the banknote has passed the point where it is possible to be rejected by the acceptor or to be withdrawn.

**7.4.7** All invalid banknotes shall be rejected and returned to the player.

**7.4.8** Under no circumstances may credits be lost if banknotes are input during game play.

**7.4.9** All acceptance devices shall be able to detect the entry of valid banknotes and provide a method to enable the LPM software to interpret and act appropriately upon a valid or invalid input (for example, the insertion of counterfeit banknotes).

**7.4.10** The LPM shall be able to detect a banknote jam that has occurred.

**7.4.11** A banknote acceptor device shall be implemented with a means to enable or disable particular value banknotes. The procedure for setting acceptable banknote values shall be by access to a secure area of the LPM. If permanent artwork is used to display the acceptable denominations, the latter method, which requires attending to each LPM, is preferred.

**7.4.12** The acceptance device(s) shall be electronically based and configured to ensure that it

only accepts valid banknotes of legal tender or coupons approved for that jurisdiction and rejects all others.

**7.4.13** An acceptance device shall include a mechanism which prohibits the input of any banknotes, or alternatively, rejects all banknotes entered, during periods when the LPM is inoperable or deactivated for any reason.

**7.4.14** The LPM, if configured for a banknote acceptor device, shall not activate the banknote acceptor if any part of the banknote acceptor that relates to the validation process, or to delivery of the banknote to the storage area, is missing.

**7.4.15** All accepted banknotes shall be deposited into the secure banknote storage area.

**7.4.16** A banknote acceptor receptacle full condition need not disable the LPM but shall disable banknote input.

**7.4.17** In the case of LPMs that support banknote acceptors that implicitly implement tokenization of the LPM, the following requirements apply to this tokenization aspect:

a) each valid banknote inserted shall register the actual MUR value or the correct number of credits for the current game. If registered directly as credits, the conversion rate shall be clearly stated on the LPM; and

b) the LPMs shall ensure that all banknotes accepted shall correctly increment the player's balance (LPM or account as the case may be) and relevant

meters in all circumstances. This includes but is not limited to cases of power failure, door open, coin tilt, audit mode entry or any other form of deactivation of the LPM.

**7.4.18**   If banknote input messages received from the banknote acceptor are to be maintained in the memory of a LPM for a period of time without being added to the player's credit balance, the storage of these messages shall be maintained in, and comply with the critical memory requirements. The LPM shall be able to recover these messages whenever it restarts, especially after a power failure or similar event.

**7.4.19**   The banknote acceptor device shall employ a reliable means of transmitting credit values to the LPM. Pulse stream interface or serial communication without error detection and correction are not considered to be reliable communication methods.

**7.4.20**   The banknote input system shall be constructed in a manner that protects against vandalism, abuse or fraudulent activity. As a guide, the following might be tested:
a) ability to prevent manipulation by the insertion of foreign objects into the banknote input system;
b) ability to prevent easy alteration to the banknote path from the exterior of the LPM without leaving evidence of physical modification of the device; and
c) ability to deliver a banknote to the banknote storage area receptacle.

**7.4.21**   An alarm shall be raised for any of the

following banknote acceptor specific conditions, unless done by staff authorized to do so and in accordance with an approved procedure:

a) opening of the banknote acceptor area outer door (if separate from the LPM main door); or

b) opening of the banknote storage area door.

## 7.5    Electronic funds transfer

**7.5.1**    If cards that employ a form of electronic storage of data are to be used, the TL shall be satisfied with all aspects of security. Some of the major concerns include the following:

a) prevention of illegal or accidental alteration of data;

b) protection from loss of data;

c) recovery of information relating to damaged or lost storage devices (for example, cards);

d) accuracy of read and write operations;

e) protection from fraudulent duplication of card information or credit balances;

f) maintenance of all EFT transactions in a system log;

g) recovery of all EFT transactions after failure of the system; and

h) correct updating to the storage media and to the system of all electronic funds transactions.

**7.5.2**    If EFT is used for gambling against a player account, no bet may exceed the available balance of an account.

**7.5.3**    The LPM card reader shall not accept an illicit card or a card that is not authorized for use.

### 7.6 Credit redemption

**7.6.1** If a player attempts to collect available credits, and the total coin value of those credits is less than the maximum CDD pay amount, the LPM shall dispense the equivalent value in coins from the CD

**7.6.2** If a player attempts to collect available credits, and the total coin value of those credits exceeds the maximum CDD pay amount, or if after a CDD pay the player attempts to collect any residual credits (for example, in a tokenized game), the LPM shall
a) generate a validated ticket for cash redemption, or
b) initiate a funds transfer to an appropriate player account, or
c) automatically lock-up and go into a handpay or cancel credit, whereby the player is given the option either to receive a cancelled credit or to cancel the cancel credit and play out the remaining credits.

**7.6.3** Whenever credits are redeemed by a player, the number of credits paid out shall be clearly displayed (collect display) and shall be correspondingly removed from the credit display. In addition the monetary value of the amount redeemed may be displayed.

**7.6.4** When there are "odd credits", or residual credits (i.e. less than the CDD base coin) in the player balance and a collect is attempted on a LPM with a CDD, the LPM shall pay out the balance as if it were a "large credit balance" (for example, by cash ticket or cancelled credit) instead of from the CDD. Alternatively, if a LPM does not have this function, or

if this function is disabled, there shall be a clear message on the LPM in a prominent position, and in a font large enough to be easily read at a distance of three meters, that states that "This gambling device does not pay out any credit amount less than <value>" (insert appropriate value in the message), or equivalent wording.

## 7.7 Cashout by printed ticket

**7.7.1** A valid ticket shall contain the following information:

a) the name of the licensed venue;

b) the unique LPM identification number;

c) the current date;

d) the time of day;

e) the value of the credit in numbers and words;

f) the unique identifying number of the ticket voucher; and

g) the validation (checksum) number, QR Code or bar code

**7.7.2** QR Codes, Barcodes or other form of machine readable markings on a voucher shall have enough redundancy and error checking to ensure that 99,9 % of all misreads are flagged as an error.

**7.7.3** Ticket voucher printing, as a method of credit redemption, is only permissible where the LPM is linked to a system or cash control system which allows validation of the printed ticket at a cashier station. Where a payout is by ticket voucher printed by the gambling equipment, the gambling equipment shall be

capable of printing a ticket voucher for all credits owed to the player at the completion of each game.

**7.7.4** A ticket request shall be rejected by the system if the device that generates the ticket security feature is not able to issue such a feature and the system shall initiate the appropriate error handling procedure.

*NOTE  A security feature includes any mark, attribute or element (for example, a ticket number) that is added or attached to the ticket in order to allow the ticket to be validated.*

## 8    Software requirements

### 8.1    Source code

### 8.1.1 Verification

**8.1.1.1** All program source codes for LPMs shall be made available for examination by the TL.

**8.1.1.2** The party that submits software shall provide the means to demonstrate, or otherwise prove to the satisfaction of the TL, that the source code supplied compiles to the same executable code as contained in the firmware program store of the LPM submitted for certification.

**8.1.1.3** When compiled, all source code supplied to the TL shall generate object code that is exactly the same as that installed in the LPM. The TL shall verify that the program or source code modules comply with the

requirements of this document.

## 8.2 Critical memory requirements

**8.2.1** <u>Critical memory</u>

Critical memory shall store all critical data.

**8.2.2**   <u>Maintenance</u>

8.2.2.1      To cater for disruptions that occur during the update process of critical memory, at any point in time during an update there shall be sufficient information to allow the software to fully recover from such disruptions without loss of critical data.

8.2.2.2      The result of the critical memory validation shall be stored and kept always up to date (i.e. shall be updated after every instance of critical memory change).

8.2.2.3 A validity check of critical data memory shall be undertaken at least before a game play.

8.2.2.4 When meters in critical memory are being updated, the software shall ensure that errors in one copy of the meter readings are not propagated to other good copies.

### 8.2.3 Detection of corruption

**8.2.3.1**    Any failure of a validity check shall be classed as either
a) recoverable memory corruption, if at least one copy of critical memory is established to be good, or
b) unrecoverable memory corruption.

**8.2.3.2**    A validity check of LPM critical memory shall be undertaken at least after every restart of the device or transaction of significance (for example, logic door closed, door closed, parameter change or reconfiguration). After a device restart (for example, power off and on), the device shall complete its validity check of the critical memory by performing a comparison check of all logical copies of critical memory.

### 8.2.4    Recovery

**8.2.4.1** If the LPM is so designed that after an uncorrectable memory corruption it is possible to view all logical copies of meters, the LPM shall highlight which of these figures are expected to be good as opposed to those that might be corrupted.

**8.2.4.2**    An unrecoverable memory corruption shall result in a RAM error.

**8.2.4.3**    If an unrecoverable memory corruption occurs, it shall require a master reset.

**8.2.4.4**    If validity checking of critical memory

information fails, and data memory remains operational, the software could recover critical memory information in order to continue game play. This option has the following implications:

a) all logical copies of critical memory shall be recreated using the good logical critical memory as a source; and

b) the device shall verify that the recreation of the critical memory was successful before attempting to identify any permanent physical memory failure. If such permanent memory failure is determined, the device shall enter the unrecoverable memory corruption sequence.

## 8.3     Program memory storage

### 8.3.1 Labelling
All program storage media shall be uniquely labelled, identifying the following:

a) the program name (and the software shell name, if applicable);

b) the name of the manufacturer;

c) the development number or the variation;

d) the version number;

e) the type and size of media; and

f) if applicable, the location in the LPM (if critical).

### 8.3.2          Write-once    read-many    (WORM) memory
**8.3.2.1** A WORM (for example, CD-ROM) used as a program or fixed data storage device shall be written

such that only the actual program and data required are written to the WORM.

8.3.2.2 The operational software shall provide an integrity check method to verify that there are no additional or missing program or data records or files on the WORM.

8.3.2.3 There shall be an ability to conduct an integrity check independent of the device's operational software to verify that there are no additional or missing program or data records or files on the WORM (for example, inserting a CD-ROM in another PC which then conducts a full signature check and directory search check over the CD-ROM space).

### 8.3.3 Reprogrammable memory

**8.3.3.1** If a reprogrammable memory device is irreversibly configured at the hardware level as a read-only device (for example, the write line is cut off), it shall be treated for all purposes as an EPROM.

**8.3.3.2** A reprogrammable memory program storage device shall be protected from unauthorized modification. Modification shall only be permitted once the TL and the GRA (or both) are satisfied with the appropriate security measures (for example, if a high voltage chip that allows modification of the reprogrammable memory devices is installed on the printed circuit board (PCB)). The method of securing the reprogrammable storage device shall be verified by

the TL and certified by the GRA on a case-by-case basis.

**8.3.3.3**   Before the termination of any programming operation on reprogrammable memory, each byte programmed shall be verified by a program comparison controlled by the programming device.

**8.3.3.4**   Only the actual program and fixed data required shall be written to the reprogrammable memory device.

**8.3.3.5**   Jumpers or similar devices can be used to enable or disable a reprogrammable memory, erasure or writing to reprogrammable memory provided there is a feedback signal to the software so that the setting of the jumper position can be recorded or appropriately acted upon. If a jumper or switch is set to "Write", then the LPM shall not be able to enter "Play" mode. These jumpers shall be located within the logic area of the LPM.

**8.3.3.6**   All reprogrammable memory devices shall be housed in a secure area.

### 8.3.4 Read or write storage

**8.3.4.1**   A read or write storage device (for example, disk or tape) used for storage of program or fixed data shall be written in such a way that only the actual program and fixed data required by the program are written to the storage device.

**8.3.4.2**   The operational software shall provide an

integrity check method to verify that there are no additional or missing program or fixed data records or files on the storage device.

**8.3.4.3** There shall be an ability to conduct an integrity check independent of the device's operational software to verify that there are no additional or missing program or data records or files on the storage device.

**8.3.4.4** All methods of integrity checking shall have the ability to identify files or records that contain variable data and exclude them from the signature calculation.

## 8.3.5 ROM program storage

All unused areas of ROM shall be written with the inverse of the erased state, which for most EPROMs are zero bits (00 hex), rather than one bits (FF hex).

**8.3.6.1** All non-critical memory RAM shall be checked for corruption at each power up.

**8.3.6.2** All devices that contain program memory or critical memory shall be validated by software. This validation may include self-checking by specific devices with internal programs. RAM and program storage device space that is not critical to LPM security need not be validated.

*8.3.6.3* Memory that does not change dynamically (for example, EPROM) shall be validated by the LPM at

least every time the hardware is reset (for example, at power on), the software is reset (where this is possible) or after a type 4 significant event. Any type 4 error should be unlocked by the defined GRA procedures.

*NOTE The fact that the LPM activates normally is deemed to be proof that validation was successful.*

**8.3.6.4** If a validity check of the software fails, it is understood that this means that the LPM cannot function as intended, in which case it shall disable itself immediately.

*NOTE This excludes transaction devices that do not influence the game results.*

**8.3.6.5** The integrity of the operation of the device shall be protected from nefarious or accidental use of the unused portions of the program memory storage media.

## 8.4 Random number selection process

### 8.4.1 General

**8.4.1.1** The RNG shall be contained in the LPM logic Area. The outcome of a gambling game shall only be determined in the logic area of an LPM. The critical memory of a LPM shall only be contained in the logic area of the LPM.

**8.4.1.2** The method of random number generation can be software-based, hardware-based or a combination of

both.

**8.4.1.3** If a software-based RNG is used, the choice of algorithm is at the discretion of the supplier of equipment.

**8.4.1.4** If, for any reason, the background RNG activity is interrupted (for example, in the case of LPM power down), it shall not be possible for the next input variable(s) for the RNG to be duplicated (i.e. in different LPMs). The method of generating the next input variables under these circumstances shall be evaluated by the TL.

**8.4.1.5** RNG tests that might be applied include the following:
a) the chi-square test;
b) the equi-distribution (frequency) test;
c) the gap test;
d) the poker test;
e) the coupon collector's test;
f) the permutation test;
g) the run test (patterns of occurrences shall not be recurrent);
h) the spectral test;
i) the serial correlation test potency and degree of serial correlation (outcomes shall be independent from the previous game); and
j) a test on subsequences.

**8.4.2 Requirements**

Game software shall generate random symbols from an RNG that uses a mapping algorithm. The fundamental requirement is that the use of an RNG shall result in the selection of game symbols or the production of game outcomes that can be proven to ensure that

a) the output of the symbols from the RNG is not predictable,

b) any outcome derived from the RNG is uniformly distributed,

c) any mappings to convert random numbers into game symbols are linear, and the distribution of the mapped symbols is identical to the distribution of the unmapped random number from which they were derived,

d) the mapped random number sequence shall demonstrate that they are statistically random when subject to the same statistical tests for randomness specified for the base RNG, and

e) the game outcomes which are derived from either a combination of mapped symbols or directly from the unmapped random numbers shall have the same distribution and probability of occurrence as the game that the machine implements. In particular, poker games shall have the same first hand distribution and probability as hands dealt from a randomly shuffled deck of cards; spinning reel games shall have the same outcome probabilities and outcome distribution as the physical model upon which the game is based, and so on.

### 8.4.3  Background RNG activity
**8.4.3.1** The mapping of numbers directly from the RNG output or through a scaling algorithm shall not

influence a symbol to occur with a probability not equal to its statistical expectation.

**8.4.3.2** If a random number with a range shorter than that provided by the RNG is required for some purpose within the LPM, the method of rescaling, i.e. converting the number to the lower range, shall be so designed that all numbers within the lower range are equally probable. Following a low probability game outcome (for example, a major prize win, or a particular graphic game result presentation), where that game outcome is represented by only one RNG value or a small number of RNG values, it is important that subsequent game play on that machine is unpredictable. That is, the machine does not subsequently go through one defined sequence of game outcomes, or one of only a few possible sequences of game outcomes. In such implementations the period of the RNG shall be much greater than its range.

**8.4.3.3** Requirements for background RNG activity are as follows:
a) the RNG shall be cycled continuously between games; and
b) when a game feature is initiated, random numbers for that feature shall be selected from the RNG.

*NOTE  The game software does not determine the outcome of a play (critical to the game result) or gamble feature until after all player options that pertain to the play or gamble feature have been made.*

**8.4.3.4** Seeding of the RNG is subject to the following requirements:

a) the method of seed generation shall ensure that the same sequence of random numbers is never used in more than one device at the same time;

b) the "next" game outcome is not able to be predicted; and

c) seeding and reseeding shall be kept to an absolute minimum.

**8.4.3.5** If a particular random number selected is outside the range of equi-distribution of rescaling values, it is permissible to discard that random number and select the next in sequence for the purpose of rescaling.

## 8.5    Information display

### 8.5.1 Display methodology

**8.5.1.1**    External displays employed in communicating the results of games shall be certified on a case-by-case basis by the GRA.

**8.5.1.2** Language    Support:    All    information technologies must provide support for the English language.  Specifically, all display technologies and software must support the ISO/IEC 10646 character set.

**8.5.1.3**    Symbols of virtual reel games (video) shall

appear to the player in the same arrangement according to the reel strips. The order of the reel's symbols displayed to the player shall not be manipulated or rearranged.

### 8.5.2 Recovery

In the event of a non-destructive fault or failure, deactivation or interruption, the LPM shall be able to recover with no loss to the player or of critical data. An error-catching routine shall exist that prevents the LPM from displaying a win amount that exceeds the maximum payout displayed on the paytable.

### 8.5.3   Last game information

**8.5.3.1** All LPMs shall be capable of storing and displaying last game data for at least the five most recently played games.

**8.5.3.2** The following information on the last game played (the game before the current game) shall be retrievable:
a) the type of game played;
b) the award table used;
c) display card values, reels in position, or other game status information;
d) the total number of credits or monetary value at the start of the game (less credits bet);
e) the total number of credits or monetary value played;
f) the player choices (if any) involved in the game outcome;

g) the total number of credits or monetary value associated with the award that result from the last play (win);

h) the total number of credits or monetary value added after the last game;

i) the total number of credits or monetary value collected or cancelled after the last game; and

j) a display of the result of feature games following the last game display.

**8.5.3.3** In the case of a stepper motor LPM, this means spinning the reels to the final resting point at the completion of the game and illuminating or flashing any lights or other indicators that were illuminated or flashing at the end of that game. The wheels, lights and display shall be returned to their original states when the viewing of the last game replay is completed.

**8.5.3.4** In the case of spinning reel games, the LPM shall display at least the final resting place of the reels, the options (play lines or number of coins selected (or both)) and an indication of winnings, in a way similar to that originally shown to the player.

**8.5.3.5** In the case of keno and bingo games, all of the balls drawn, the selections made by the player and the final result shall be displayed in a way similar to that originally shown to the player.

**8.5.3.6** In the case of card games, all cards dealt in a game shall be shown on the screen. In the case of poker or any other game with a hold or discard strategy, it is

necessary to show the symbols and cards held and those discarded.

## 8.6     Prescribed display formats

**8.6.1**     If dates and times are displayed, they shall be displayed in a consistent in 24-hour format i.e. dd.mm.yyyy:hh:mm:ss.

**8.6.2**     Field separators within times shall be colons ( : ) or full stops ( . ). Time of day shall be given as MUT.

## 8.7     Metering- Audit Meters and Displays

**8.7.1** Unless otherwise specified in legislation, the value displayed by the meter may be in either credits or in monetary values (i.e. Mauritian rupees (MUR) and cents) as long as the units used are clearly shown near to the meter or display

**8.7.2** The "total bet" is a required soft meter defined as the total value of all credits bet. In the case of multigame LPMs, this meter is also required and a separate value shall be maintained for each configured game on the LPM.

**8.7.3** The "total win" is a required soft meter defined as the total value of all credits won. In the case of multigame LPMs this meter is also required and shall be maintained for each configured game on the LPM.

**8.7.4** The "total coin box drop" is a required soft meter defined as the total value of coins or tokens to

the coin box drop of the LPM. An additional period meter is required in audit mode, to be reset following each clearance of the coin drop storage area.

**8.7.5** The "total bill drop" is a required soft meter defined as the total value of all bills entered into the bill acceptor connected to the LPM. An additional period meter is required in audit mode, to be reset following each clearance of the bill storage area.

**8.7.6** The "total games played" is a required soft meter defined as the total number of games started and completed on the LPM. The units shall be in games. In the case of multigame LPMs this meter is also required and shall be maintained for each configured game on the LPM.

**8.7.7** The "total hand pay" is a required soft meter defined as the total value of all hand pays, including hand pays less than one coin or token, hand pays greater than the CDD limit. It is a required soft meter and shall be designated on all reports or displays as "Total Hand Pays.

**8.7.8** The "total cash in" meter is defined as the total value of all cash entered into the LPM (including amounts transferred from a card in an EFT environment). It shall be designated on all reports or displays as "Total Cash In". Separate meters for "cash", "EFT transactions" and "tickets/vouchers" that are added to derive the "total cash in" amount are acceptable.

**8.7.9**	The "total cash out" meter is defined as the total value of all cash paid out of the LPM (including hand pays, printed tickets and vouchers and amounts transferred to a card in an EFT environment). It shall be designated on all reports or displays as "Total Cash Out". Separate meters for "cash" "EFT transactions" and "tickets/vouchers" that are added to derive the "total cash out" amount are acceptable.

**8.7.10**	The "total EFT in" meter is defined as the total value of all credits transferred from a card to a LPM in an EFT environment. If the LPM has EFT functionality, this shall be designated on all reports or displays as "Total EFT In". If the LPM does not support EFT, this meter is not required.

**8.7.11**	The "total EFT out" meter is defined as the total value of all credits transferred to a card from a LPM in an EFT environment.

**8.7.12**	If the LPM has EFT functionality, this shall be designated on all reports or displays as "Total EFT Out". If the LPM does not support EFT, this meter is not required.

**8.7.13**	The "last five bills in" display shall enable the LPM to display, in audit mode, the MUR value of each of the last five bills entered into the bill acceptor. The bills shall be listed in the order they were entered, with the most recently entered bill listed first.

**8.7.14** When a meter, of any type, reaches its maximum value, it shall automatically revert (i.e. "wrap round") to zero and subsequently continue counting (from zero) in the normal way.

**8.7.15** The LPM shall have a function that enables the display of all metered information retained. It is not mandatory that metering information be displayed on the LPM from which the information originates. The information may be displayed on an external device or on a computer (or on both) to which the LPM has communicated such information.

## 8.8 Metering — Player displays

**8.8.1** A LPM shall be able to display the information given to the player (as applicable to either "EFT" or "non-EFT" environments). Note that this does not prevent more than one piece of information being presented on the same display unit, provided that the associated artwork is not deemed to be misleading.

**8.8.2** The "credit display" shall display the current number of credits available to the player under the heading "Credits". This display shall be updated immediately after each bet is made and at the end of the game, when it shall be increased by the value displayed by the "Win" display. It is acceptable to additionally display the MUR value if desired.

**8.8.3** The "bet display" shall display the cumulative total number of credits bet by the player during the

current game to the player under the heading "Bet". This display shall be updated at the start of each game. It is acceptable to additionally display the equivalent MUR value if desired.

**8.8.4** The "win display" shall display the (cumulative) number of credits won for each win won by the player during a single game (and therefore the prize that has been won at the completion of each game) to the player under the heading "Win". This display shall be updated at the occurrence of each new win, and at the start of each game. It is acceptable to additionally display the equivalent MUR value if desired

**8.8.5** The "collect display" shall display the number of credits collected from the LPM by the player under the heading "Collect" or "Paid". This display shall be updated each time the player collects credits from the LPM (whether by CDD, hand pay, printed ticket or voucher, or EFT card) and at the start of each game. It is permissible to display, in addition to the credit amount, the equivalent MUR value, if desired.

**8.8.6** Player displays may be incremented or decremented (for example, stepped) to the value of the actual meter for visual effect. However, the internal storage of these displays shall be immediately added to (not incremented or decremented over a period of time).

**8.8.7** The number of credits collected shall be subtracted from the player's credit display.

**8.8.8** The value of the win display shall only be added to the player's credit display.

**8.8.9** The player's credit display shall always be prominently displayed in all modes except audit, configuration and test modes. During game play in second screen bonus features, the player's credit amount does not need to be displayed, provided that the player is not required to bet additional credits during the feature.

**8.8.10** The player's credit display shall have sufficient digits to allow the display of at least twice the credit value of the maximum prize. Tokenization and denomination configurable parameter options shall not permit credit values that are greater than the credit to be displayed.

**8.8.11** Whenever credits are bet (for example, at the commencement of the game or in the event of additional wagers during a game) the number of credits bet shall be immediately subtracted from the player's credit display and displayed on the bet display.

**8.8.12** It is mandatory for a multigame LPM to show the monetary value of the player's available credits on the game select screen. The monetary value of the player's available credits may also be shown on each game play screen in addition to the player's available credits for that game. This requirement is optional for a single game machine.

**8.8.13** If the current MUR amount is not an even multiple of the tokenization factor for a game or if the credit amount has a fractional component, the credits displayed for that game may be displayed and played as a truncated amount (i.e. fractional part removed). However, the fractional credit information shall be made available to the player when the truncated credit balance is zero or on the game select screen.

**8.8.14** At least the following displays shall be able to be shown separately for each game offered on a multi-game LPM:
a) total of all credits bet; and
b) total of all credits won.

**8.8.15** Prize determination shall
a) be clearly specified on the exterior of the device, or easily accessible to the player, and
b) be exclusively a consequence of the outcome of a computer based RNG in conjunction with the prevailing payout table and rules of the game.

**8.8.16** There shall be a game selection screen where the full amount of the player's credit balance is displayed either in MUR and cents or in credits.

**8.8.17** Only credits taken as wins by the player or automatically credited by the LPM shall be added to the "Win" meter.

**8.8.18** When residual credits are played off, credits bet shall be added to the "Total bet" meter.

**8.8.19** When residual credits are played off, and if any credits are won, the value of the win shall be added to the "Win" meter and shall either

a) increment the player's credit meter, or

b) be automatically dispensed, and the value of the coin(s) added to the "Coins out" meter.

**8.8.20** The value of every prize (at end of game) shall be added to the credit display.

## 8.9 Labelling

All non-mandatory, retrievable electronic statistics or other information shall be suitably labelled.

## 9    Operational requirements

### 9.1    Access to restricted features

Access to the following restricted features of gambling equipment shall be regulated by at least a key switch, or by key-based access to the inside of the machine cabinet:

a) auditing information;

b) statistical information;

c) test functions; and

d) any other features deemed by the GRA to be restricted.

### 9.2    Set-up — Device configuration

### 9.2.1 Configuration of variables

**9.2.1.1** A variable required to be set during device configuration or set-up shall not be able to be changed except following a valid memory clearance, unless able to be changed by some other secure method

**9.2.1.2** A LPM shall not be able to be operated unless all configuration variables are set. A device may be configured remotely or by direct access by means of an approved mechanism.

**9.2.1.3** If memory becomes corrupted, a LPM shall not assume default values and recommence gambling operation unless the assumed values have been configured by an approved mechanism.

**9.2.1.4** A gamble feature bet option shall only be enabled or disabled in setup mode and the appropriate configuration change significant event shall be generated.

## 9.2.2 Device enrolment

There shall be no configurable parameters on an LPM.

## 9.2.3 Reconfiguration
**9.2.3.1** The LPM may be reconfigured to modify only the following parameters, but only by a secure approved method:
a) the mapping of random numbers to cards or symbols;
b) the game or sets of games approved for play;
c) denomination and tokenization; and
d) the paytable.

**9.2.3.2** All configuration settings required for the proper operation of the LPM shall be entered before the LPM can enter "Play" mode. If all configuration settings required have not been entered, the LPM shall detect this condition and remain disabled.

## 9.3　　System security

**9.3.1**　　The set of games offered to the player for selection, or their paytables, may be changed only by a secure approved method. No changes to the set of games offered to the player for selection (or to their paytables) are permitted while there are credits on the player's credit meter or while a game is in progress.

*NOTE  The intention is to prevent any modification to the selection of games offered, or to their paytables, as the result of player history. The player may switch between any games offered without terminating the session.*

**9.3.2**　　Gambling equipment shall disable all player inputs and suspend all gambling functions while any of its secure area doors are opened or remain open.

**9.3.3**　　LPMs shall not have any functions or parameters adjustable by or through any separate computer, input device or input codes, except for the following:
a) the adjustment of features that do not affect functionality in any way;
b) the downloading in an authorized manner of any software, data or operational parameter; and

c) an approved configuration (set-up) mode.

**9.3.4**    In general, the reactivation of a LPM that has been deactivated shall require manual intervention by the gambling venue operator or the system operator. The following exceptions apply:

a) if a door open event occurs other than a logic door open, the LPM may reactivate automatically when the door is eventually closed;

b) if the personal identification number (PIN) retry limit is exceeded for a player's account card, the LPM shall remain deactivated until the card is removed; and

c) if the power supply to a LPM fails, the LPM is deactivated as a matter of course. It is permitted for the LPM to automatically reactivate itself unless it determines that there was a configuration or software change while the power was down, in which case the LPM shall remain deactivated until manually reactivated.

*NOTE The venue operator may choose to require manual reactivation in all cases.*

**9.3.5**    If a LPM loses communication with its site data logger, the LPM shall disable itself.

**9.3.6**    Where a LPM is unable to operate without the loss of any information (for example, metering, transactions or significant events) it shall immediately disable any further game play.

**9.4    Master reset**

**9.4.1**     Following the initiation of a master reset procedure (using an approved RAM clear method), the game program shall execute a routine which initializes each and every bit in RAM to the default state.

**9.4.2**     It shall not be possible to reset any critical RAM without first accessing the logic area.

**9.4.3**     The default reel position or game display after a master reset shall not be a winning combination on any selectable line. The default game display upon entering game play mode shall also be a  non-winning game.

*NOTE  The selection of a specific "default" combination that is displayed after every reset is acceptable, as long as it is a non-winning combination (i.e. it need not be selected at random).*

**9.4.4**     A configuration setting that is required to be entered during set-up mode immediately following a master reset shall not be able to be changed after the machine leaves set-up mode.

**9.5     Door open procedures**
The following procedures shall be performed on the occurrence of any door open
a) any software state prior to door opening shall be saved;
b) any game play shall be saved in its current incomplete condition;
c) if mechanical reels are spinning prior to the door

opening, the reels shall continue spinning after the door is closed;

*NOTE There should not be a false impression created that the game achieved a result while the door was open, or just prior to the door being opened;*

d) credit input shall be disabled (may be re-enabled for the duration of a credit input test or CDD test);

e) the machine shall clearly indicate that the door has opened and game play is not possible;

f) if in CDD payout, the CDD shall be turned off and the brake applied (may be re-enabled for the duration of a CDD test);

g) all player inputs that can affect a play in progress shall be disabled (unless used in door open or test mode); and

h) cashout of any kind to players shall be disabled.

**9.6     Door close procedures**

When any door is closed the software shall return to the condition prior to when the first door open state occurred, except when the LPM detects that there has been a configuration or software change. This means that

a) a message or other indication stating that the door has closed, or other indication (i.e. such as the disappearance of a message or indication stating that the door was opened) shall be displayed; this may be for a preset period or until the next game play,

b) any relevant player inputs shall be re-enabled,

c) the alarm shall be turned off, and

d) any incomplete game play when the event occurred shall recommence from the beginning of the play or from the point at which interruption occurred and conclude

normally, using the data that were saved previously.

### 9.7 Audit mode

**9.7.1** It shall always be possible to enter audit mode when the LPM is in idle mode.

**9.7.2** The device shall not be playable while auditing information is being displayed on the device

**9.7.3** It is not mandatory that auditing information be displayed on the device from which the information originates. The information may be displayed on an external device or on a computer (or on both) to which the LPM has communicated such information

**9.7.4** It is preferred that all non-game specific player displays (for example, credit display, win display, bet display and collect display) are displayed in the same position for all games.

**9.7.5** Audit mode shall include as a minimum, the following items:

a) display of all electronic meter and display information;
b) last game replay;
c) display of LPM identification; and
d) display of software or game identification (or both).

### 9.8 Demonstration mode

**9.8.1** Demonstration mode (where implemented)

may only be entered into by means of an approved secure method evaluated by the TL and approved by the GRA, and only while

a) the main door is open, and

b) the LPM is on-line to a data controller unit or bank controller.

**9.8.2** While the LPM is operating in the demonstration mode, there shall be clear notification that the LPM is in that mode (for example, by tower light signal or on-screen message) and the main door of the LPM shall be open at all times.

**9.8.3** If soft meters are incremented in the demonstration mode, such credits shall be automatically cancelled upon the change of the LPM from demonstration mode to game-play mode.

**9.8.4** A LPM in demonstration mode shall not be capable of being used as an off-line LPM. Some suggested implementations which might help prevent such illegal activity are:

a) not to allow coins to be entered into the LPM (i.e. lockout) except in accordance with approved coin test procedures;

b) not to allow any coins out for credits in the LPM except in accordance with approved CDD test procedures;

c) to provide a spot on a touch screen or to interpret a button (for example, service) that shall credit the LPM with a number of coins;

d) if a "ticket" cashout is allowed, to clearly mark the

ticket that is printed as a non-valid ticket including a non-valid serial number (for example, all zeroes or nines); and

e) if the main door is closed, to let the LPM immediately exit demonstration mode and return to game-play mode.

### 9.9 Idle mode

**9.9.1** While the LPM is in idle mode, if there are credits showing on the credit display, the following shall remain on view until the next play:

a) the bet display for the last play;

b) the final reel stop positions, card values, etc. for the last game play; and

c) the win display from the last play (unless a payout has occurred since completion of the last game play, and the "win" display has been used as a "collect" display).

**9.9.2** Multigame LPMs may have a "Game Select" mode entered from "Idle" mode where the above information is not required to be displayed. If "Game select" mode is entered, it is necessary to display all of the information above when the same game is selected again.

**9.9.3** During idle mode, if a payout has occurred since the completion of the last game play, the collect display that represents the payout shall be displayed. If multiple payouts have occurred since the last play, the collect display of the last payout only shall be displayed. Additionally, the cumulative payout amount

may be displayed.

### 9.10    Test or service mode

**9.10.1**    While the LPM is operating in the test mode, there shall be clear notification that the LPM is in that mode (for example, by tower light signal or on-screen message).

**9.10.2**    Opening the main cabinet door of the LPM may automatically place the LPM in a service or test mode. A diagnostics test mode may also be entered by means of an appropriate instruction from an attendant during an "Audit" mode access.

**9.10.3**    If there are any test-mode states which cannot be automatically cancelled by closing the door, (for example, if it is first necessary to manually set a switch) or exit from the "Audit" mode (if that was the method of entry to the "Test" mode), the action necessary shall be indicated on the machine and in the relevant manuals.

**9.10.4**    Test games, if implemented, shall
a) not increment any meters, other than a temporary on-screen credit display,
b) only be available after entering a specific test game mode within door open mode, and
c) be clearly indicated as not in normal game play mode.

**9.10.5**    The following information shall be accessible in test mode if not available in audit mode:

a) the revision number for game (and if applicable, base) software in the machine;

b) set-up and configuration data; and

c) the expected return to player (RTP).

**9.10.6** If a CDD test is implemented that does not require the door securing access to the CDD to be opened, no meters that are used to calculate revenue shall be affected.

## 9.11 Power save mode

**9.11.1** If a LPM has a "Power save" mode it shall only be activated when the LPM has been idle for a period of time not less than 5 min, or when LPM is in a disabled state.

**9.11.2** For the purposes of this subclause, a LPM shall be defined as being "idle" if, for the nominated duration, it

a) does not have any key switch activated (for example, accessing "Audit" mode),

b) does not have any door open,

c) has no credits on the player prize display yet to be transferred to the player's credit display,

d) has not had any coins or banknotes input,

e) has not had its touch screen touched,

f) has not had any button pressed,

g) does not have any fault condition, or

h) does not have any electronic funds transfer or credit transfer to or from the LPM pending.

*NOTE 1 Power save mode should be capable of being enabled or disabled by staff by means of set-up mode.*

*NOTE 2 Power save mode may be activated manually (i.e. by means of an auxiliary power switch or key switch) and in this case the conditions listed above are void.*

**9.11.3**     While in "Power save" mode, power may be removed from the coin diverter, incandescent display, monitor and all fluorescent lights. Critical security functions of the LPM shall still be performed.

**9.11.4**     The LPM shall exit from "Power save" mode and return to the normal display mode immediately upon it ceasing to be "idle" (if not using a manual power save implementation).

## 9.12     Mechanical reels and wheels

**9.12.1**     Microprocessor-controlled reels (for example, stepper motor reels) shall automatically re-spin to the last legally obtained play-mode result when the play mode is re-entered (for example, the main door is closed, power is restored, audit mode is exited, or a fault condition cleared).

**9.12.2**     Reel bounce and float shall be prevented when a spinning reel is being stopped.

**9.12.3**     Each microprocessor-controlled reel shall spin at least one revolution per play unless stopped by player intervention as provided for in the rules of the game.

**9.12.4**   A reel or wheel assembly shall be so designed that the spin of each reel is not obstructed by any other component.

**9.12.5**   Microprocessor-controlled reels shall be monitored to detect malfunctions such as a reel that is jammed, or is not spinning freely, or has failed to stop, or any attempt to manipulate their final resting position.

**9.12.6**   The control of electromechanically controlled display devices, such as spinning wheels and roulette wheels, shall be sufficient to enable the system to detect a malfunction or an attempt to interfere with the correct operation of that device. This may also be achieved by a last game recall facility.

**9.12.7**   Reel assemblies shall have a clearly identifiable reference point at which the start of the strip symbol artwork is located.

**9.12.8**   Reel assemblies shall be so constructed that winning symbol combinations match up with the pay lines.

## 9.13   Video displays

**9.13.1**   An attract mode may be used, as long as the information required while in idle mode is displayed after the attract mode has completed its cycle.

**9.13.2**   If the display is over-written by the paytable,

on restoration of the game screen the same display, that shows the winning combination resulting from the last game played, shall be suitably highlighted.

**9.13.3** Screen save functions are subject to the following constraints:

a) any screen save function shall only be activated when there are no credits on the machine;

b) if a fault condition exists on the machine when the program enters the screen save function, the nature of the fault shall be displayed, otherwise the machine shall exit the screen save; and

c) the screen save mode shall cease upon the occurrence of any of the following:

1) the activation of an input device;
2) any door opening; or
3) an error event condition.

**9.13.4** Touch screens, if used, shall comply with the following:

a) touch screens, which are accessed by the player, shall be resistant to scratching from conditions likely to occur during normal use;

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

c) touch screens shall be designed and installed such that static build-up is minimized to a level that ensures no humanly perceptible static is discharged through a grounded player that touches the screen;

d) LPMs that employ touch screens shall have a recalibrating facility that may be either manual or

automatic, but in any case shall not require access to a logic area;

e) touch screen selected input shall always be interpreted accurately and acted upon in accordance with the description of the choice (indicated on the screen) made by the player;

f) if the opening of the LPM door is found to affect touch screen calibration and recalibration is carried out with the door open, there shall be in place means to ensure that the recalibration is correct when the door is closed (for example, two sets of calibrations one for door open and one for door closed);

g) touch screen button icons shall be sufficiently separated to reduce chances of the wrong icon being selected due to incorrect calibration or parallax errors; and

h) all buttons and touch points shall be documented.

### 9.14    Electronic funds transfer system

A LPM shall retain a card used for EFT gambling within the card reading device, once inserted, except if an amount debited from the card is placed directly on the credit meter and no further transactions are required from the card (for example, updating of account balance or credit out). The LPM shall not release the card until one of the following conditions is met:

a) a player has requested a collect of remaining credits and all updating of account records or information (or both) has been successfully completed;

b) a player has a zero credit balance and all updating of account records or information (or both) has been

successfully completed;

c) an invalid card event condition has been cleared by an approved method; or

d) power or communications failure (except that, if conditions (a) and (b) are met, the LPM may release the card after successfully completing the updating of account records or information, or both).

### 9.15    Player input

**9.15.1**    The player's selected input shall be interpreted correctly and acted upon in accordance with the description of the choice as indicated on the labelling artwork or display.

**9.15.2**    A LPM shall not be affected by the simultaneous or sequential activation of the various inputs.

**9.15.3**    In regard to multi-line games, each additional line that is brought into play by the wagering of a further credit or credits shall be clearly so indicated by the game that the player is in no doubt as to which lines are in play.

**9.15.4**    In the case of multi-line games, the winning play line(s) shall be clearly highlighted to the player. This may be accomplished by drawing a line over the symbols on the play line(s) or flashing of winning symbols and line selection box (or both). Where there are wins on multiple lines, alternative indication (for example, alternate flashing of winning patterns) may be

given.

## 10 Game design requirements

### 10.1 General

**10.1.1** Games that have a component of strategic skill (for example, draw poker and blackjack) shall comply with the following requirements:

a) the actual player return for a typical strategy, based upon the information available to the player in the game rules, shall not be less than the theoretical RTP;

b) any strategy advice or automatic holds shall be fair and not misleading to the player and shall not represent a poor choice;

c) the player shall be able to override the automatic hold; and

d) the automatic hold strategy shall be used in calculating the RTP of the game.

**10.1.2** The presentation of mapped symbols or artwork shall not alter or be modified during play, except in cases of animation during a play or as a part of the game rules, which shall be clearly described on the artwork, otherwise this constitutes a different game.

**10.1.3** A machine shall not have any faults present, or be in any test, metering, door open or lockup mode, etc., for a game to begin.

**10.1.4** Games that involve player physical dexterity (for example, hand and eye coordination) shall return

at least the minimum RTP without adaptive strategies. For example, the size of a target area shall be independent of results previously achieved.

**10.1.5** Credits bet may come from the credits that the player has available to bet or from the number of coins inserted.

**10.1.6** The game may not be considered to be completed until all the appropriate meters for the game have been updated. It is permissible to update the credit meter before the completion of play provided that critical memory is updated when the credit meter is updated.

**10.1.7** If multigames are implemented, there shall be a method available so that it is possible to disable and enable individual games on multigame LPMs. If it is not possible to accomplish individual game enable and disable, the entire machine shall be capable of being enabled or disabled.

## 10.2　　Rules

A game shall follow a constant set of rules and shall at no time deviate from those rules. A rule change constitutes a different game, although variations to the maximum number of credits bet per game or lines per game (or both) are permitted. This requirement does not preclude implementations of games with multiple parts or features provided that the rules are clear to the player.

## 10.3    Game fairness objectives

**10.3.1**    Each time a game element (base, primary, feature, bonus or free) is played, there shall be a chance of obtaining any of the results displayed on the appropriate paytable of that game.

**10.3.2**    Events of chance within the games shall be independent of (i.e. not correlated with) any other events within the game or any other events within previous games, except as provided by the rules of the game (for example, for metamorphic games).

**10.3.3**    The intent of the objectives is to ensure that, where applicable, the probability distribution of each event within a game is as it
a) appears to the player,
b) is represented to the player, and
c) could reasonably be inferred by the player.

*NOTE This requirement does not prohibit the use of virtual reels.*

**10.3.4**    LPMs shall not cheat, mislead or unfairly disadvantage players.

**10.3.5**    The player shall be advised as to the frequency of the shuffling of cards (for example, by wording in the artwork or on the display screen).

**10.3.6**    Game fairness objectives for games such as horse, car, animal racing, golf or football and virtual

reality games shall be assessed on a case-by-case basis by applying the general game fairness objectives.

**10.3.7** Capping of awards shall not be permitted.

## 10.4 Result-determination methodologies

**10.4.1** In the case of any LPM, result determination for each individual play within a game shall

a) be for all attainable combinations of the mapped symbol set (except for random awards),

b) be clearly specified on the exterior of the gambling equipment (or in a way readily available to the player and clearly apparent),

c) be a consequence of one of the result determination methodologies described in this clause,

d) have a theoretical RTP not less than that specified in legislation, and

e) ensure that the maximum prize is not greater than that specified in legislation.

**10.4.2** If a game's theoretical return cannot be reasonably calculated, the manufacturer shall provide the TL with sufficient documentation that will allow the TL to determine an approximate theoretical RTP which shall be not less than the minimum RTP specified in legislation.

**10.4.3** The minimum RTP shall be met when playing at the lowest end of a non-linear paytable (for example, if a game is continuously played at a minimum bet level for its total game cycle and the theoretical RTP is lower

than the minimum RTP specified in legislation, then the game is unacceptable). This example also extends to games such as keno where the continuous playing of any spot combination results in a theoretical RTP lower than the minimum RTP specified in legislation.

**10.4.4** The result in game play can be determined only by pure chance.

**10.4.5** The LPM shall not have any means of manipulation that can affect the probabilities of random event outcomes during game play.

**10.4.6** Events of chance within games shall not be influenced, affected, controlled or determined by anything other than (in conjunction with the prevailing payout table) numerical values obtained in an approved way from the certified RNG.

**10.4.7** If the player's skill can influence the final outcome of the game, the game shall provide appropriate strategies for selection and holding of elements of the game (such as reels and cards) which, if followed exactly, shall ensure that the theoretical minimum RTP shall be not less than that defined in the appropriate legislation.

**10.4.8** At the start of each game play, the method by which all random behaviour is derived during the game shall be fully determined and frozen.

**10.5    Game features**

**10.5.1**     If a feature activity is provided in which the player has to wager credits, the player shall be given a choice whether to enter the feature activity or not. A player who elects not to enter the feature activity shall be positioned at the beginning of the primary game.

**10.5.2**     A game may offer random awards, provided that the award value complies with that specified by legislation.

**10.5.3**     Initial entry to a feature activity shall be conditional upon an immediately preceding occurrence of a winning event in the primary game.

**10.6     Metamorphic features**

**10.6.1**     Where allowed by the GRA, features that are not completely independent of play history (i.e. that are metamorphic) shall
a) display clearly to the player which game rules apply to the current game state,
b) display to the player sufficient information to indicate the current status towards the triggering of the next metamorphosis of the game (for example, if the game collects tokens towards a feature, the number of tokens missing or the total number required to trigger the metamorphosis shall be indicated along with the number of tokens collected at that point),
c) not adjust the likelihood of a metamorphosis occurring, based on the history of prizes obtained in previous games (i.e. games shall not adapt their theoretical RTP based on past payouts), and

d) not be misleading. If a game's metamorphosis is triggered after accruing a certain number of tokens or combination of tokens of different kinds, the probability of obtaining such tokens shall not deteriorate as the game progresses (for example, for identical tokens the last few tokens needed shall not be more difficult to obtain than the previous tokens of that kind).

**10.6.2** The game's player return over the cycle of both the metamorphic and non-metamorphic part of the game shall comply with the minimum RTP as specified by legislation.

**10.6.3** Any accumulated metamorphic game tokens shall not be lost during a full reconfiguration if the game that includes the tokens is still available after the full reconfiguration.

**10.6.4** The maximum prize paid out by the game over the cycle of both the metamorphic and non-metamorphic parts of the game shall not exceed that specified in legislation.

**10.6.5** If a metamorphic feature game requires extra credits to be wagered and the game accumulates all winnings (from the trigger and the feature) to a player win display (rather than directly to the player's credit display), the game shall
a) provide a means where winnings on the player win display can be bet (by means of the credit display) to allow for instances where the player has an insufficient

credit balance to complete the feature, and

b) transfer all credits on the player win display to the player credit display upon completion of the feature.

**10.6.6**    The inclusion of metamorphic features in a game shall not cause the RTP of the overall game to lessen to a value below that of the base game.

**10.6.7**    If the player is allowed to wager at less than the available optimum strategy during a metamorphic game feature, the manufacturer shall provide evidence that this option shall not reduce the overall player return for that game below the minimum theoretical RTP as specified by legislation.

## 10.7    Card games

The consequences for games that depict cards being drawn from a pack are as follows:

a) at the start of each game or hand, cards shall be drawn fairly from a randomly shuffled pack that consists of the full set of cards applicable to the game depicted;

b) once removed from the pack, cards shall not be returned to the pack except as provided by the rules of the game depicted;

c) the pack shall not be reshuffled except as provided by the rules of the game depicted;

d) as cards are removed from the pack, they shall be immediately used as directed by the rules of the game (i.e. they shall not be discarded owing to adaptive behaviour by the LPM); and

e) it is permitted to reshuffle the remainder of the deck

between draws during a single game.

## 10.8     Ball-drawing games

The consequences for games that depict balls being drawn from a barrel (for example, bingo) are as follows:

a) at the start of each game only balls applicable to the game shall be depicted;

b) once removed from the barrel, balls shall not be returned to the barrel except as provided by the rules of the game depicted;

c) the barrel shall not be remixed except as provided by the rules of the game depicted; and

d) as balls are drawn from the barrel, they shall be immediately used as directed by the rules of the game (i.e. they shall not be discarded owing to adaptive behaviour by the LPM).

## 10.9     Roulette Wheel, Spinning Reels, Dice Rolling, Coin Tossing Games)

**10.9.1** In the case of games that depict or involve

a) the spinning of reels (such as slot machines or poker machines),

b) the spinning of wheels (such as roulette),

c) the rolling of dice,

d) the tossing of coins, or

e) other similar depictions,

the requirements in 10.9.2 to 10.9.5 (inclusive) shall apply.

**10.9.2** If virtual reels that map to physical reels are used, each of the reel stops of the virtual reel strip shall have the same probability of occurring (i.e. if the virtual

reel consists of n positions, the probability of occurrence of each position shall be 1/n). Symbols of the physical reel shall appear to the player in the same arrangement as would the corresponding symbols of the virtual reel (i.e. it shall not be possible to determine by observing the symbols displayed on the machine that the physical reels are used instead of virtual reels). This observation extends to all symbols visible to the player. Accordingly, mapped symbols shall have identical sequences of preceding and following symbols (if these symbols are visible to the player) on both the physical and virtual reel strip.

**10.9.3**    The behaviour of each reel, wheel, dice, coin etc., shall be independent of (i.e. uncorrelated with) all other reels, wheels, dice, coins, etc.

**10.9.4**    The behaviour of each reel, wheel, dice, coin etc., shall be independent of (i.e. uncorrelated with) its previous behaviour.

**10.9.5**    For each wheel, dice, coin, etc. depicted, the probability of any one face appearing shall be as for the actual physical device (for example, 1/20 for a 20 wheel; 1/6 for a 6 faced dice; and 1/2 for a coin).

**10.10    Maximum prize**

The maximum prize paid out by a LPM shall be as specified in legislation and shall be displayed on the LPM.

## 10.11  Game play

### 10.11.1. Game initiation

**10.11.1.1** An LPM shall only initiate game play
a) after credits have been registered,
b) after the player has nominated the number of credits to bet on that game, and
c) after the player presses a "play" button (or similar input, for example, a touch screen), or
d) after the player has inserted the maximum bet.

**10.11.1.2**     Where the above items are combined, such as "auto-play" buttons, or where pressing the "play" button causes a default number of credits to be selected, such facilities should be acceptable, provided that these functions are clearly explained in game instructions (for example, on button artwork).

**10.11.1.3**     If an autoplay mode is incorporated, it shall be possible to turn this mode on or off at any time during game play.

### 10.11.2.  Game completion
The game is considered completed when the player cannot continue play activity without committing additional credits from the credit meter or CAD, and has no credits at risk.

### 10.11.3      Multigame machines

**10.11.3.1**      The methodology employed by a player

to select and discard a particular game for play on a multigame LPM shall be clearly explained to the player on the LPM, and be easily followed. The LPM shall clearly inform the player of all games available at that time and offer them for selection.

**10.11.3.2** It shall not be possible to start a new game before the current play is completed and all relevant meters and displays have been updated (including features and other options of the game) unless the action to start a new game terminates the current play in an orderly manner.

**10.11.3.3** Machines that offer multiple games shall at all times indicate to the player which game has been selected for play or is being played. The player shall not be forced to play a game just by selecting that game.

**10.11.4** **Tokenization**

**10.11.4.1** Devices that implement tokenization shall ensure that if a sequence of higher value coins is entered, no credits shall be lost even if there is a power failure of the gambling equipment before all of the credits are incremented to the player's balance.

**10.11.4.2** Tokenization and denomination configurable parameter options shall never allow the maximum prize value set by legislation to be exceeded.

**10.12** **Feature games**

**10.12.1** In all cases, except for gamble features, the number of credits bet on feature games shall be added to the total bet meter regardless of whether they are bet from the credits won in the base game or not, and shall be subtracted from the player's credit display.

**10.12.2** If a base game can be followed by feature games, the credits won at the end of each feature shall be added to the player's win display and to the total win meter maximum prize value set by legislation.

## 11 Artwork requirements

### 11.1 General

**11.1.1** This clause is mainly applicable to spinning reel games. However, some parts of this clause are also applicable to draw poker, bingo, and other game types. The rules given apply to reel strips (physical or video), belly panel and top panel artwork (physical or video implementation) and, to a limited extent, to screen and display artwork. The layout of the reels display window is not specified.

**11.1.2** Reel strips shall have a reel number.

**11.1.3** The manufacturer's logos or copyright messages may be visible, but in a discreet manner.

**11.1.4** By making a submission to a jurisdiction for evaluation, the manufacturer, supplier and operator of gambling equipment indemnifies the relevant

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jurisdiction, its duly appointed testing agents, the government of the jurisdiction and the state of any claim by any party for breach of copyright, trademark, or registered name or design which may arise from the distribution of literature (such as rules of play) or operation of approved gambling equipment.

**11.1.5** Artwork graphics shall not in any way or form be indecent or offensive.

**11.1.6** These requirements refer to all forms of artwork (i.e. anything that appears on the top panel, belly panel, buttons, on the area surrounding the display, and on the display itself). The combination of all relevant messages appearing anywhere on the artwork shall comply with these requirements.

**11.1.7** The artwork requirements apply equally to artwork displayed in physical form and in virtual form (for example, on a video display, as a holograph image and on a liquid crystal display (LCD) or similar display).

**11.1.8** Where both multiplier instructions and tabulated prizes are displayed on artwork, there shall be no confusion possible as to whether the multiplier applies to the tabulated prizes or not.

**11.1.9** The outcome of each game shall be displayed for a reasonable length of time.

**11.1.10** If any game instructions are on the video screen only, they shall be accessible and visible

without the need for credits to be inserted or staked. This requirement does not apply during game play except where specific instructions might be required to proceed to the next stage of the game.

**11.1.11**        If the artwork contains game instructions specifying a top award, it shall be possible to win this amount from a single game (including features or other game options). For example, if the artwork states that MUR 500 is the top award for a game it shall be possible to win MUR 500 on that game.

**11.1.12**        The functions of all buttons (in normal game mode) shall be clearly indicated, preferably on the button itself.

**11.1.13**        Customized artwork that makes use of stickers shall use stickers that do not shrink or peel with time or heat. Where possible, stickers shall be applied on the back of the artwork glass, to avoid intentional removal. Stickers applied to other parts of the LPM shall not be easily removed. Stickers shall comply with the part number requirement, however where size limitations occur, the part number may be affixed to the sticker backing or surroundings.

**11.1.14**        If different versions of the artwork require a cutout or a window (for example, a card reader), each modification shall be submitted for testing and certification.

**11.1.15**        The name of the game being played shall

be clearly visible to the player.

**11.1.16**          The coin or token denomination of the machine shall be clearly visible at all times, preferably near the coin slot. If the machine uses tokens or tokenization, the number of credits registered for each token or coin respectively shall also be displayed.

**11.1.17**          All game instructions shall be in English and both grammatically and syntactically sound. Exceptions may be acceptable on a case-by-case basis.

**11.1.18**          In the Western culture, the assumed direction of instructions is from left to right and from top to bottom. These directions shall be used as much as possible. Considerable breach of this common rule shall make the artwork unsuitable.

**11.1.19**          All game instructions on the artwork shall be easily interpreted, clearly visible, not ambiguous, and sufficient to explain all game rules. Common sense rules shall apply. Game play and device usage instructions shall be stated unambiguously and shall not be misleading to the player.

**11.1.20**          There shall be sufficient game instructions to allow a player to determine the correctness of prizes awarded. If random prizes are offered, the maximum value obtainable from the random prize shall be indicated. If the value of the random prize depends on credits wagered this shall be stated.

**11.1.21**        All statements on the artwork shall be true. The pay scale on the artwork shall correspond to the pay scale used in the mathematical treatise as submitted to the TL.

**11.1.22**        The display of the result of a game outcome shall not be misleading or deceptive to the player (for example, it shall not improperly indicate a near miss). Where symbols appear on a pay line, these shall be clearly bisected by the pay line.

**11.1.23**        Initial player selection options shall be described (for example, selection of a runner in a horse race shall identify name, number and expected payout).

**11.1.24**        Player selection options once the game has begun shall be clearly shown on the screen.

**11.1.25**        The winning amount for each separate wager and total winning amount shall be displayed on the screen.

**11.1.26**        All artwork that is relevant to game play or displays information required by the player shall be clearly marked with a part number unique to that manufacturer and with the name or logo of the manufacturer. Successive versions of the artwork shall have different part numbers, if applicable.

**11.1.27**        All occurrences of the scattered symbols should be labelled with the word "scatters" (or an equivalent) where they appear on the artwork panel.

**11.1.28** Upon a win, all pay lines shall be clearly indicated. If it is possible to bet more than five lines, then upon a win for video machines, the pay lines shall be indicated in a manner such that all pay lines can be clearly identified by the player.

## 11.2 Game-specific artwork

### 11.2.1 Card games

In the case of card games, the following apply:

a) It shall be clearly stated if more than one deck of cards is used in the game.

b) The artwork shall clearly state if the rules of the game do not shuffle the deck after every game. In this instance, the artwork shall indicate when shuffles actually do occur.

c) As a minimum, the player shall be able to view a tabulated display of the paytable that shows all winning hands and their payouts when no game is in progress.

### 11.2.2 Blackjack

In the case of blackjack, the following apply:

a) Insurance rules shall be clearly explained if insurance is available

b) Pair-split rules shall be explained. Areas to be dealt with are the following:

1) split aces have only one card dealt to each ace, if this is the game rule;
2) further splits, if available; and
3) double-down after splits, if available.

c) Double-down rules shall be clearly explained including limitations of which totals may allow a double down to be selected.

d) The current total of all hands, including the dealer's total, shall be displayed during and at the end of the game. The term "Bust" or the equivalent may be used to indicate a hand whose total has exceeded 21.

e) Dealer play rules shall be clearly explained including special treatment of a soft 17 count, if any.

f) Any limits on the number of cards that may be drawn by player or dealer (or both) shall be explained including winners declared (if any) when the limit is reached (for example, five under wins).

g) Surrender rules shall be explained, if any exist.

h) If the player loses on "dealer push" this shall be clearly explained.

i) Deal rules used shall be clearly explained.

j) Winning hands shall be clearly labelled as to the win category, for example, "blackjack", "six under" or "push".

k) If pair splits have occurred, the results for each hand shall be shown (total points, resultant win or loss category, amount won, amount wagered).

l) Special rules, if any, shall be clearly explained.

m) All player options that are available at any point in time shall be shown on the artwork.

### 11.2.3   Poker

In the case of poker, the following apply:

a)     The artwork shall provide clear indication if stud poker rules apply. Draw poker is assumed if nothing is stated.

b)        The artwork shall provide a definition of winning combinations outside the scope of standard poker, for example, royal flush without wild cards, four of a kind, "jacks or better", and four deuces (when deuces are wild).

c)        Wild card rules shall be clearly explained, for example, jokers wild or deuces wild.

d)        Held and non-held cards, including recommended holds (if implemented) in draw poker or the equivalents shall be clearly marked on the screen, and the method for changing holds clearly displayed to the player.

e)        Winning hands shall be clearly labelled as to the win category, for example, "full house".

f)        All special rules outside the scope of common poker shall be clearly explained.

g)        When player options outside the scope of common poker are currently available, they shall be clearly explained on the artwork.

### 11.2.4  Simulated races

This subclause refers to games with simulated races with for example, animals (for example, horses), vehicles (for example, motor bikes) and humans (for example, 100 m dash). The following apply.

a) All participants in the race shall have characteristics that make it unique in appearance (for example, number, jockey colours).

b) The result of the race shall be clearly obvious and not open to misinterpretation.

c) If prizes are to be paid for combinations that involve runners other than just the first place finisher, the order

of the place getters that can be involved with these prizes shall be clearly shown on the screen (for example, result 8-4-7).

d) Each meaningful result position shall be available for display in all last game replays.

e) The rules for alternative wagering options, for example, quinella, and the expected payouts shall be clearly explained on the artwork.

### 11.2.5  Scratch tickets

This subclause refers to games that simulate a lottery scratch tickets or similar. The following apply.

a) a precise definition of which player options shall be taken to complete the game, shall be shown on the artwork;

b) details of how payouts are won and their amounts shall be shown on the artwork, for example, three matching scratched symbols win that prize; and

c) all rules for symbols that may substitute in winning patterns shall be displayed on the artwork.

### 11.2.6  Roulette

If standard roulette is simulated, the following rules apply (variations shall be considered on a case-by- case basis):

a) Each "zero" used shall be uniquely labelled (for example, "0", "00", "000").

b) The simulated roulette wheel shall be in the identical format as a standard casino wheel (including colours of landing locations and positions of numbers) with the exception of the position of "zeroes" if more than one

exist, in which case the "zeroes" may be placed arbitrarily.

c) A scorecard or description of all available wagers and their payouts shall be accessible by the player while not in game play.

d) The method of selecting individual wagers shall be explained by the artwork.

e) The wager(s) already selected by the player shall be displayed on the screen.

f) The simulated ball spin shall result in a location that unambiguously determines the winning number.

### 11.2.7   Dice

This subclause refers to standard dice games. Variations shall be considered on a case-by-case basis. The following apply:

a) Each face shall clearly show the number of spots.

b) Simulated dice shall be of the same layout as standard dice (for example, the 1 and 6, 2 and 5, and 3 and 4, respectively shall be on opposite faces).

c) It shall be obvious, after each dice has been thrown, which side is face up.

d) The result of each dice shall be clearly visible or displayed.

e) There shall be a description of each wagering option available on the artwork. For example, the craps wagers "field" and "hardway" shall be clearly explained.

f) All possible wagering options available and obtainable at any point in time shall be displayed on the artwork.

### 11.3 Awards layout

**11.3.1** The awards for the winning combinations of each symbol shall be placed in an area that visually belongs to the symbol. This can be achieved with appropriate boxing. The symbol shall preferably be placed on the left-hand side of the award scale.

**11.3.2** The number of symbols that is required to appear in the reels display window in order to trigger each award shall be indicated. These numbers shall line up with the awards in order to avoid any ambiguity as to which award corresponds to which number. The use of pointers is also encouraged.

**11.3.3** If some symbols share the same pay scale, they shall be placed in an area that visually belongs to the pay scale. This may be achieved with appropriate framing or boxing. The group of symbols shall be associated with its award, and shall not invade the area that visually belongs to some other group of symbols if this could cause ambiguities.

**11.3.4** If the awards for multiple credits staked are tabulated, the number of credits bet required for each award shall be placed above (preferably) or underneath the awards' scale. Each such number shall have associated with it the word "credits" or an equivalent. Common tabulations shall display the number of credits bet as column headings and the number of symbols required as row headings.

**11.3.5**   Games that can be tokenized shall have all award references in credits and not in coins.

**11.3.6**   The nature of all awards shall be clearly indicated. If some awards are in cash whilst others are in credits, this shall be stated.

## 11.4   Positioning, size, colour and shape

**11.4.1**   If game instructions refer to a particular symbol, preference shall be given to the use of the actual symbol rather than a description of the symbol. For example, game instructions such as "when a pair of sunglasses occurs "shall become "when <sunglasses symbol> occurs ... ".

**11.4.2**   Game instructions that belong to only one symbol or to a group of symbols shall be clearly associated with the symbol or group of symbols. This may be achieved with appropriate framing or boxing. Additional wording such as "these symbols" may also be used.

**11.4.3**   Symbols that are not characters or numbers shall maintain the same shape throughout all artwork.

**11.4.4**   Game instructions shall be printed in a colour that contrasts with the background colour. For example, red print on a black background is hard to read for some people, and is not acceptable.

**11.4.5**   Game instructions that refer to all symbols or

awards shall read "all" (or an equivalent). If some symbols or awards are excluded from these instructions, this shall be indicated with wording such as "except" (or an equivalent).

## 11.5 Winning patterns

**11.5.1** This subclause refers to spinning reel variations with draw poker characteristics where the player may hold one or more reels for a second chance to improve the hand. The artwork shall deal with the following:

a) held and non-held reels, including recommended reels, shall be clearly marked on the screen at all times;

b) the method for changing holds shall be clearly displayed to the player;

c) if the player is required to wager additional credits to participate in the hold reels phase of the game, this shall be stated; and

d) display that the player is able to hold or release reels.

**11.5.2** All winning combinations relevant to the particular point in time of a game shall either be clearly displayed or shall be accessible. All non-defined combinations are assumed to be non-winning.

**11.5.3** The trigger combination(s) and all other conditions that have to occur in order to trigger a feature, shall be specified unambiguously. The action of the game when feature trigger patterns occur during the feature (for example, free games) shall be clearly stated

on the artwork (for example, further triggers, bonus payout or no further trigger (or both)).

**11.5.4** If generic winning patterns (graphical representation of how the symbols of the same kind shall appear) are only represented graphically (without the aid of a verbalized explanation), they shall be supplemented with numbers to indicate to how many correct symbols each pattern corresponds. An exception to this requirement is the case of unusual winning patterns (for example, X_X_x_X_X), where numbers shall not be displayed and the pattern shall be positioned in proximity to the prize.

**11.5.5** Winning patterns that are not "left to right" or "right to left" or "any", shall be clearly explained, preferably with pictorial representations.

**11.5.6** If it is possible to bet on multiple possible lines and it is not clearly obvious which reel positions are part of each of the possible lines, the additional lines shall be clearly displayed on the artwork, and appropriately labelled. The additional lines shall either be shown on static artwork or be available for display on a help or paytable screen or permanently displayed on all game play screens in a location separate from the actual reels. This requirement applies to all standard five-reel games where lines greater than five shall be schematized on the artwork and appropriately labelled.

**11.5.7** This subclause refers to games, such as keno and bingo, where balls are drawn from a simulated cage

or the equivalent and a player tries to pick in advance which of these balls are selected. The following apply:

a) the player shall be able to view or access a tabulated display of the scorecard that shows all winning payouts when no game is in progress;

b) any special rules that are outside the standard games of keno shall be clearly explained;

c) all of the player's selections shall be clearly identified on the screen;

d) the balls drawn shall be clearly identified on the screen;

e) the game shall highlight balls drawn that match the player's selections (i.e. "hits");

f) special hits, if any, shall be clearly identified;

g) the screen shall provide clear indication of how many balls were selected and how many hits occurred;

h) rules for purchase of additional features of the game, if any, shall be explained;

i) the artwork shall clearly state how the player makes or changes selections. The following areas to be dealt with:

    1) how individual numbers are picked;
    2) how individual numbers are cleared; and
    3) how all selections are cleared.

**11.5.8** The artwork shall explain all rules relative to free games. The following areas relative to free games shall be dealt with, in addition to the general requirements in 11.5.7:

a) Additional payouts for non-winners during the free game sequences, if any, shall be displayed on the artwork. A clear indication shall be given whether this payout is multiplied by credits staked per line or the total

credits staked.

b) Any multipliers for prizes, special prizes, substitutes and other special rules during free games, shall be displayed on the artwork.

c) A clear display of an accumulated win amount is required during each stage of the free games if the LPM does not directly add wins to the credit meter.

d) If more than one free game is offered, the number of free games that has occurred or the number that remains (or the total number) shall be displayed.

e) Appropriate game instructions shall define the number of possible lines and credits per line that are wagered during the free games.

**11.5.9**    The prizes for the winning patterns of each symbol shall be placed in an area that visually belongs to the symbol. This can be achieved with appropriate boxing or framing. The symbol or group of symbols shall be associated with its prize, and shall not invade the area that visually belongs to some other group of symbols if this could cause ambiguities.

The number of symbols required to appear in the reels display window, in order to trigger each prize, shall be indicated. These numbers shall line up with the prizes in order to avoid any ambiguity as to which prize corresponds to which number.

**11.5.10**    Card faces shall clearly display the card value (for example, it shall be obvious which is a jack and which is a queen). Card faces shall clearly indicate the suite. The colour of the hearts and diamonds suites shall be red, clubs and spades shall be black. Jokers shall be

easily distinguishable from all other cards.

**11.5.11** This subclause refers to metamorphic games where the player still "pays" for the sequence game(s). The following apply:

a) All instructions for the game including the differences between the main game and the metamorphic game shall be stated (for example, <character> appearing anywhere in window pays the original prize which started the feature).

b) There shall be a statement that the number of lines or number of credits wagered (or both) during the metamorphic sequence may not exceed the wager of the game or games that triggered the feature, if that is the rule of the feature.

c) Any special prizes, substitutes, multipliers or similar rules during the metamorphic sequence shall be clearly stated on the artwork.

d) If the metamorphic sequence consist of more than one feature game, the number of games in the metamorphic sequence that have occurred or the number that remains (or the total number) shall be displayed.

**11.5.12** This subclause refers to games where one or more bonus prizes may be paid to the player during the feature sequence. Generally, bonus prizes are awarded as a result of some second (or subsequent) screen animation. The following applies.

a) Criteria for entry to further bonus features as well as the initial entry shall be clearly stated.

b) All instructions and player choices for the bonus feature shall be clearly stated.

c) A display of total amounts won shall be available at the end of each stage of the game including on second screen animations. This shall include display of bonus prizes won to date in multiple sequence bonus features.

d) If bonus prizes are multiplied, the artwork shall clearly state whether they are multiplied by credits staked per line or total where appropriate.

**11.5.13** The artwork shall appropriately state that all wins occur on selected lit lines (and "except scatters", if applicable) or equivalent.

**11.5.14** The scattered symbol shall be clearly labelled with the word "scatters" on first occurrence in the game instructions. Further occurrences of the scattered symbol in the game instructions do not require further labelling.

**11.5.15** The winning combinations and pays for scatters shall be explicitly stated or displayed.

**11.5.16** The following requirements apply for artwork for games where one or more reels are automatically "held" for one or more "re-spins":

a) The rules for the criteria for the re-spin and which reel positions are held shall be clear and without possible misinterpretation. Examples of areas that shall be dealt with are:

1) which reels shall be held, for example first two reels;

2) whether held reels occur on winning or non-winning patterns;

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3) the specific line where the trigger combination shall occur, if any (for example, "on the centre line"), or scattered if that is the actual requirement of the game; and

4) if a partial number of reels (for example, 2, 3 or 4 reels) are held for some criteria, it shall be clearly stated what happens when the criteria form part of a larger pattern (for example, what happens when all five reels comply with said requirement).

b)      If the trigger is a winning pattern and the pattern does not pay during re-spins, this shall be clearly stated on the artwork.

c)      The rules for extensions or termination of the re-spin sequences including additional held reels, for example, improvements to the original held combination(s), shall be clearly explained on the artwork.

**11.5.17**   In the case of games with rules that allow for the accumulation of tokens to qualify for a feature or multiple feature to be triggered or game metamorphosis, the artwork shall clearly show

a) the definition of the event that leads to the accumulation of tokens,

b) a description of how many tokens are accumulated with each occurrence of the event,

c) a description of how many tokens are required to trigger the feature,

d) an indication of how many tokens are currently accumulated,

e) if sub-tokens accumulate to tokens, a description of the number of sub-tokens needed to accumulate a token and the number of sub-tokens and tokens currently accumulated,

f) if the accumulation of tokens may lead to free games, the number of possible lines and credits per line that shall be wagered during the free games, and

g) game rules when further tokens are not accumulated during the feature sequence for events which normally would qualify to earn tokens.

## 11.6    Gamble feature

**11.6.1**    All gamble feature instructions should be easily interpreted, and they should suffice to explain all rules.

**11.6.2**    The gamble feature limit (if applicable) for a particular game and the maximum number of gamble features available should be clearly stated, preferably on the video display.

*NOTE If wording exists that indicates the maximum award that can be won, it should be possible to win this award.*

**11.6.3**    When the gamble feature option is exited automatically before reaching the maximum number of gamble features available, the reason shall be clearly displayed.

**11.6.4**    All references to gamble feature shall use words (for example, "gamble feature" or "double up") which cannot be misinterpreted to indicate some other feature.

**11.6.5**    Any conditions in which the gamble feature option cannot be accessed should be specified.

**11.6.6**    If a gamble feature offers a choice of multipliers (for example, "pick a suit" which might have four

outcomes), it shall be clear to the player what the range of choices or payouts are.

Once the player has selected a multiplier, it shall be clearly stated on the display which multiplier was selected.

### 11.7    Artwork wording

**11.7.1** Conventions used in the wording of this subclause

**11.7.1.1** The following conventions regarding artwork wording apply:

a) Some of the wording of this subclause is only relevant to reel games.

b) None of the wording used in the examples given is prescriptive. Because of the large variety of statements that can be constructed, only examples of a particular kind of statement are provided. For example, if one statement includes references to scatters, such as "except scatters", such references can be extended to a number of other statements. The reader is responsible for identifying such situations and constructing appropriate variations. Also, for some statements, opposite statements exist.

These opposites are not specified. For example, if the instructions say, "No free games can be triggered during free games", the opposite statement might read "Additional free games can be triggered during free games", and vice versa.

c) Game instructions relative to triggers of feature games are also not specified, nor are other game instructions that do not vary between different games

for the same manufacturer.

d) Not all the words used during features are included, since they might only be relevant for specific games.

e) Some of these statements are very general and shall be read in conjunction with some other, more specific statements in order to describe the rules of the game accurately.

f) Combinations of many of the statements are possible, but are not discussed.

g) The symbol "x" or "X" is used to denote variables that can be symbols, numbers or letters.

**11.7.1.2** All rules that relate to the game shall be able to be clearly displayed to the player.

**11.7.1.3** The artwork shall clearly state the rules for payments of prizes where multiple wins are possible. The following shall be dealt with:

a) A description of what patterns shall be paid when a pay line may be interpreted to have more than one individual winning pattern.

b) Where the game supports multiple pay lines, a message that indicates wins on different pay lines are added or the equivalent shall be displayed.

c) Where the game supports scatters, a message that indicates that scattered wins are added to pay line wins or equivalent, shall be displayed if this forms part of the rules of the game.

d) Treatment of coinciding scattered wins with respect to other possible scattered wins shall be clearly stated. For example, if both Pink Elephants and Red Frogs pay as scattered symbols and Purple Clovers substitute for

both scattered symbols, the artwork shall state whether combinations of these scattered symbols pay all possible prizes or only the highest prize.

e) Where mixed symbol prizes are paid, the treatment of prizes that may be interpreted to be both mixed and straight winners shall be described.

**11.7.1.4** In games that permit multiple credits to be wagered on selected lit lines, the artwork shall either clearly state that the win(s) for each selected lit line shall be multiplied by the number of credits wagered on that line or show a tabulation of all possible wagers and their payouts.

## 11.7.2   Examples of general statements in artwork

**11.7.2.1**  "Win XXX credits on a lit or pay line"
This indicates the maximum award that can be won for a single winning pattern. The total award awarded as a result of a play could exceed the XXX award, since a variety of awards can be won on different pay lines.

**11.7.2.2**  "All wins to credit meter"
All credits won are added to the credit meter.

**11.7.2.3**  "Play 1 to XXX lines" or "Bet 1 to XXX credits per line" or "Play up to XXX credits" or "To start the game, press one of the XXX buttons"
The button that starts a game (bet per line button or number of lines bet button) is specified, to avoid confusion. The maximum number of credits that can be bet is also displayed.

If some of the instructions in 11.6.2 are obvious from the artwork displayed in the button panel or video screen, some of the wording can be omitted.

### 11.7.3 Examples of general mandatory statements

**11.7.3.1** "Malfunction voids all pays and plays" Credits accumulated as a result of a failure of the LPM to function in the way in which it was designed and intended to function, are not valid and therefore shall not be paid.

**11.7.3.2** "All wins shown in credits" The LPM only shows wins in credits.

### 11.7.4 Examples of coinciding wins statements

**11.7.4.1** "Coinciding wins are added" Each symbol can be used only once for interpreting individual paying patterns. When two or more paying patterns are awarded, none of the symbols can participate in both winning combinations, except when the substitute symbol substitutes multiple times. If a winning combination consists entirely of substituting symbols, generally only the highest award is awarded, i.e. the award for the substituting symbols, or the award for the combination with the substituted symbols, whichever is the higher (except scatters). Other special cases that do not behave according to the above definition are clearly defined by additional wording.

**11.7.4.2** "Coinciding wins on different lit or pay

lines are added"
Wins that occur on each chosen line are added to the wins meter.

**11.7.4.3** "Highest win only on each/anyone lit or pay line" or "Highest win only" or "Highest pay line win only paid" or "Highest win only, except scatters"
Only the highest award is awarded on each lit line. If scatters are added, an appropriate combination of game instructions shall be used.

### 11.7.5   Examples of statements regarding features

**11.7.5.1** "Each of the non-winning lit lines during free games pays X credits multiplied by credits staked per line, including when scattered wins occur"
Any non-winning chosen line pays X credits, including when a scattered win occurs on that chosen line.

**11.7.5.2** "Non-winning combinations that occur on centre line during free games pay X credits multiplied by the number of credits staked, including when scattered wins occur"
Any non-winning centre-line combination pays X credits, multiplied by credits staked, including the case when a scattered win occurs.

**11.7.5.3** "During free spins, the initial win is not repeated"
If the reels held during the free spins represent a winning combination and if such a combination is improved as a result of a free spin, the original

combination is not paid again. Only if the initial combination is improved shall an award be paid.

**11.7.5.4**          "During free games all wins are doubled"
Any win that occurs during the free games is at double the scheduled prize. If some prizes are offered only during free games, such prizes are also doubled when they occur. If prizes that are offered only during free games are already doubled, a statement excludes them from the above game instruction.

*NOTE The word "doubled" can be substituted with any other multiplier.*

**11.7.5.5**          "Free games cannot be won again during the feature"
Free games can be triggered only during normal play. If a free game trigger occurs during the free game series, and a special prize is awarded in place of the series of free games, this is specified with an appropriate statement on the artwork.

*NOTE This is only one of the many statements that regulate triggers of free games. Because these rules are game specific more cases are not discussed but should be treated on a case-by-case basis.*

**11.7.5.6**          "During free spins, the initial win is repeated each time no bigger win occurs"
If the reels held during the free spins represent a winning combination and if such a combination is not improved

as a result of a free spin, the award of the win that started the feature is awarded again.

### 11.7.6  Examples of statements regarding scatters

"Scattered awards added to lit lines or centre line wins" or "Scattered wins are always added to pay line wins" or "Coinciding scattered wins are added to pay line wins" Scattered awards are always added to wins that occur on the chosen lines even if they occur on the same line as some other win.

*NOTE  The statement "coinciding scattered wins added" is not acceptable.*

### 11.7.7 Examples of statements regarding substitutes
**11.7.7.1**      The artwork shall state all rules relative to substitutes that participate in scattered wins. The following shall be dealt with:

a) if applicable, the artwork shall specifically state when the term "substitutes for all symbols" is used but the substitute does not participate in scattered wins (for example, <sub> substitutes for all symbols except scattered <scatter symbol>)

b) the artwork shall state payout rules for coinciding wins when there are multiple scattered win symbols and substitutes participate, including the situation where one or more scattered symbols may not appear; and

c) the requirements in (a) and (b) also apply to any change of substitutes, if this occurs.

**11.7.7.2** If there is a feature where a symbol may substitute in a winning pattern when the symbol is not on a pay line, this shall be clearly specified on the artwork.

**11.7.7.3** The artwork shall clearly state if the game provides for a change of substitutes, (for example, during free games) and any special conditions that might apply.

**11.7.7.4** If the game provides for extra pays or if multipliers apply when substitutes participate in winning patterns, a clear explanation shall be provided.

**11.7.7.5** If the game provides for multipliers to apply when substitutes participate in winning patterns, the multiplication factor or a tabulation of all prizes with possible multipliers shall be displayed.

**11.7.7.6** If extra pays or multipliers apply when substitutes participate in winning patterns, the handling of winning patterns where multiple substitutes participate shall be clearly explained.

**11.7.7.7** A substitute symbol acts like a wild card in a card game.

**11.7.7.8** "X substitutes for A, B, C ..."
Only the symbols indicated are substituted. If more than one substitute symbol exists, the range of symbols that are substituted by each substitute is specified.

**11.7.7.9** "Each symbol can participate only once

in any pay line win"

When substitute symbols are used, to clarify the fact that the substitute symbol pays only in the highest paying pattern, wording to this effect shall be used. Also to avoid confusion when any paying pattern is used, such wording is desirable.

**11.7.7.10** "X substitutes for all symbols and for all scattered pays at the same time"

If a game offers two or more scattered symbols which are substituted by the symbol X, this wording explains that X substitutes up to a number of times: once in a pay line winning pattern, and once for each scattered symbol. Scattered symbols are substituted even when none of the scattered symbols appear on the display.

**11.7.7.11** "If one or more X substitute in a winning pattern the prize for that winning pattern is doubled. Doubled prizes are shown in the coloured column."

The substitute symbol X doubles the prize of a winning pattern in which it substitutes. Prizes for winning patterns for the symbol X are not doubled as the symbol X does not substitute for itself. If the symbol X also doubles the prizes for scatters, this is indicated on the artwork with appropriate additional wording.

**11.7.7.12** "X substitutes for all symbols, including scatters"

The symbol X substitutes a number of times concurrently: once for any non-scattered symbol and once for a scattered symbol. If X can substitute in two different winning combinations of non-scattered

symbols, it substitutes only in the highest paying one. If X substitutes several times on each line, including for non-scattered symbols, this is stated on the artwork. The symbol X always substitutes for scatters even if no scattered symbols are displayed. If X is substituting, it does not pay for its own winning combinations, except when it is substituting for scatters.

**11.7.7.13** "X Substitutes for all symbols [Optional: Including or Except Scatters]"
The symbol X may substitute in any winning pattern in replacement for a symbol required by that pattern (for example, queen/substitute/queen, the substitute qualifies as a queen to make three queens). Unless the optional "except scatters", or the equivalent, is used, the substitute participates in scattered wins. Further qualification may be required to clarify circumstances of games with coinciding wins rules.

**11.7.7.14** "X substitutes for all symbols except A, B, C .."
The symbol X substitutes for every symbol except the symbols as indicated. If more than one substitute symbol exists, the range of symbols that are excluded by each substitute is specified.

**11.7.7.15** "Every X that substitutes in a win combination multiplies the award for that combination by XX"
The award of the combinations is multiplied by XX for each substituting symbol.

**11.7.7.16** "If one or more X substitute in a win combination, the award for that combination is doubled. Doubled awards are shown in the coloured column" The substitute symbol X doubles the award of a combination in which it substitutes. Awards for winning combinations for the symbol X are not doubled because the symbol X does not substitute for itself. If the symbol X also doubles the awards for scatters, this is indicated on the artwork.

**11.7.7.17** "X substitutes for all symbols, including centre line and both scattered pays all at the same time" or "X substitutes for all symbols and both centre line and scattered pays at the same time" If a game offers two scattered symbols that are substituted by the symbol X, this wording explains that X substitutes up to three times: once in a centre-line combination, and once for each scattered symbol. Scattered symbols are substituted even when none of the scattered symbols appear on the display.

**11.7.7.18** "X substitutes for all symbols and X can be shared multiple times when substituting"
The symbol X can be used as a substitute as many times as required to complete winning combinations if at least one symbol of the winning combination is displayed. If no symbols of a winning combination other than X are displayed, then X does not substitute, but it pays for its own winning combination. If X is substituting, it does not pay for its own winning combinations, except when it is substituting for scatters. X always substitutes for scatters.

**11.7.7.19**          "Every X that substitutes in a winning pattern multiplies the prize for that winning pattern by XX." The prize of the winning pattern is multiplied by XX for each substituting symbol.

## 11.7.8 Examples of statements regarding tabulation

**11.7.8.1**          "The award for one credit staked is multiplied by the number of credits staked (per line)"
If the pay scale for one credit is tabulated only for a few possible number of credits staked, the partial tabulation acts as the sample or guideline. To obtain an award that is not covered in the tabulation, the award for one credit staked is multiplied by the number of credits staked. Wording such as "Wins multiplied by credits staked" is not appropriate if partial tabulation exists because it does not state which awards are multiplied.
If partial tabulation exists, the artwork shall clearly indicate that the prize for one credit (or other appropriate bet) staked is multiplied by the number of credits bet (per line). Alternate game instructions shall ensure that it is not possible to incorrectly assume that the tabulated prizes are further multiplied by credits bet.

**11.7.8.2**          "Credits Bet" or "Total Credits Bet"
Used on multi-line games to distinguish between total credits wagered on a game and credits bet per line.

**11.7.8.3**          "Credits bet per line"
If wins for different credits bet per line are tabulated, use of this wording as a heading of a column in the tabulation

indicates that the awards are for credits bet per line.

**11.7.8.4** "All wins multiplied by credits staked" or "All wins multiplied by credits staked per line"
This wording shall only be used if the pay scale for one credit bet is displayed and the full tabulation of the award scales for additional credits bet is not displayed. If a full award scale tabulation for any number of credits bet is already displayed, the wording shall also say "As indicated".

**11.7.8.5** "These wins multiplied by credits staked (per line)" or "Scattered pays are multiplied by the total number of credits staked"
The wins that visually belong to the above statement are multiplied by the number of credits staked. If some wins are excluded from the above statement, these game instructions shall be appropriately modified.

**11.7.8.6** "Credits"
If wins are multiplied by the total number of credits staked, the heading of the columns of the tabulation indicate the number of credits required for each award.

**11.7.9 Examples of statements regarding winning lines**
**11.7.9.1** "All wins on lit/bet lines only" (viewed in conjunction with a scatters statement)
All wins (except scatters) are paid only when the combination appears on a selected lit line.

**11.7.9.2** "All wins on centre line, except scatters" or

"Centre line pays only" (viewed in conjunction with a scatters statement) or "All wins on centre line only" (viewed in conjunction with a scatters statement).
Scattered wins can appear on any line according to the specified winning pattern. Other combinations are only paid on the centre line.

### 11.7.10          Examples of statements regarding winning patterns
**11.7.10.1                  "Of a kind"**
When many symbols share the same award scale, the wording "Of a kind" shall be positioned immediately above, beneath or beside the number of symbols required to complete a winning combination. The wording "Of a kind" is preferable to "Of a kind pays", to avoid a possible misinterpretation of an award with the numbers that indicate the winning pattern.

### 11.7.10.2      "All pays left to right only, including scatters"
For example, for a five-reel machine, all awards are awarded for combinations of one, two, three or four of a kind from left to right, or for five of a kind.

### 11.7.10.3      "All pays left to right or right to left (or both), including scatters"
Awards may be awarded for combinations of one, two, three or four of a kind in a sequence from either side, or for five of a kind.

### 11.7.10.4      "All pays left to right, except scatters"
The winning patterns for scatters are specified

separately.

### 11.7.10.5     "All pays left to right and right to left, except scatters"

The winning patterns for scatters are specified separately.

### 11.7.10.6     "Mixed:&lt;symbol X&gt; or &lt;symbol Y&gt; or &lt;symbol Z&gt; mixed"

Any combination of the symbols X, Y, Z that appear on the pay line (or scattered if the symbols are scatters) and according to the specified paying pattern shall win the indicated award.

*NOTE This is defined as occurring when two or more winning patterns of a distinct kind are displayed.*

If prizes can be awarded for mixed or grouped symbols, the artwork shall clearly specify the grouping of the symbols either by placing the symbols in an area that clearly belongs to the pay scale and labelled with the term "mixed" (or the equivalent) or by using a descriptive term that clearly defines the grouping.

### 11.7.10.7     "All pays for two or more adjacent symbols, except scatters"

The winning patterns for scatters are specified separately.

### 11.7.10.8     "All pays for two or more adjacent symbols, including scatters"

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Awards may be awarded for combinations of two, three or four of a kind beside each other on a line, or for five of a kind on a line.

## 12      Significant events requirements

### 12.1      General

**12.1.1** The LPM shall be programmed to create the event response internally and, where required, deactivate game play.

**12.1.2** In the following list, four types of significant event are defined:

a)        type 1: information only (no deactivation);

b)        type 2: events that lead to automatic deactivation but also allow for immediate automatic reactivation when the problem is solved (for example, authorized door open);

c)        type 3: events that lead to automatic deactivation and require manual reactivation; and

d)        type 4: events that lead to automatic deactivation and require manual reactivation, but only after the GRA audit procedures have been followed. These procedures might involve immediate approval for reactivation, or the approval could be withheld until physical inspection by an GRA inspector is completed.

**12.1.3** By definition, all type 4 events shall be logged.

*NOTE  The phrase "manual reactivation" is understood to include closing of the logic door (if necessary) or turning of a reset key.*

**12.1.4**  Significant events other than type 1 that occur on a LPM shall cause a clearly displayed message that an event has occurred and, unless otherwise indicated, shall also result in the following:
a) all player inputs shall be disabled, including coin and banknote input;
b) an identifiable alarm shall be activated, which may be either a tower light, or a sound of at least 1,5 s duration (or both);
c) any game result shall be saved; the reels or video display shall not display a false game outcome; and
d) if the LPM was in CDD payout, the CDD shall be turned off and the brake applied.

**12.1.5**  The following actions shall be performed, if possible, on clearing of the fault on an LPM:
a) any messages shall be removed;
b) any relevant player inputs shall be re-enabled;
c) the alarm shall be turned off; and
d) any game play when the fault event occurred shall restart from the beginning of the play or from the point at which the interruption occurred and conclude normally, using the data that were saved previously.

**12.1.6**  All LPM fault conditions shall activate an alarm, which shall include either a tower light or sound (or both).

**12.1.7** To assist with service and fault diagnosis, the nature of the event shall be displayed.

## 12.2 LPM and terminal events

**12.2.1** Configuration change (type 4)
Change of denomination, switches or jumpers, etc.

*NOTE 1 It is acceptable if the LPM only detects the changes when restarting.*

*NOTE 2 Reportable changes include any change to any configuration that alters the metering or the game outcome or the RTP of the game. Changes that need not be reported include, for example, the sound, the tower light, settings that might enable or disable a peripheral, or changes to the visual aesthetics of the LPM.*

**12.2.2** Master reset (type 4)
Intentional memory clear of the RAM and other volatile memory of a LPM has occurred.

**12.2.3** Error detected in volatile memory (type 4)
Failure of internal test.
The failure of some test(s) means that the LPM cannot function correctly, in which case it shall disable itself immediately.

**12.2.4** Logic area access (type 4)
Opening of the logic area door.
The LPM shall detect the opening of the logic area door (or access to the logic area).

**12.2.5**    Power on (type 1)
Power is successfully restored and the device can operate.

**12.2.6**    Logic area closed (type 1)
A sensor registers that a logic door has been closed.

**12.2.7**    Enter test or audit mode (type 2)
If the LPM has a test mode or special staff or audit mode, a significant event shall be signaled when such mode is entered.

**12.2.8**    Exit test or audit mode (type 2)
If the LPM has a test mode or special staff or audit mode, a significant event shall be signaled when such mode is exited.

**12.2.9**    "Coin in tilt" or "Coin out tilt" (type 2)
Sensors in the coin path shall indicate when a coin is jamming the path.

**12.2.10**    CDD empty or malfunction (type 2)

**12.2.11**    "CDD runaway", "coin out tilt" or "extra coin(s) paid" (type 2)
One or more coins are improperly paid by the CDD.

**12.2.12**    General enclosure access (type 2)
Opening of outer enclosure door, excluding the drop box door.

**12.2.13**   Drop box door open (type 1)
Opening of drop box door.

**12.2.14**   Enclosure door closed (type 2)
A sensor registers that a door has been closed.

**12.2.15**   Cancel credit (type 2)
Any incident of a manual cancel credit (for example, due to book or hand pay) shall indicate a significant event. The value of the credits shall be included in the significant event report.

**12.2.16**   Low memory back-up battery (type 4)
The voltage that is produced by the battery or another device for maintaining the contents of RAM is approaching a level below which the memory cannot be maintained for a minimum of 14 d without mains power and data might be lost or corrupted.

**12.2.17**   Coin interference (type 2/R)
External interference with a coin or token acceptor or validator. This refers to coin yo-yo, stringing, etc.

**12.2.18**   Reel error (type 2)
A reel position does not agree with software control.

**12.2.19**   Collect credit (type 1)
Cashout that exceeds the limit specified by legislation.

*NOTE This significant event is not specified in Mauritian legislation at present, but may be required later.*

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**12.2.20** Banknote receptacle is removed (if the banknote storage area uses a receptacle) (type 2)
The LPM shall automatically disable itself.

**12.2.21** Banknote storage area access (type 2)
When the banknote storage area is accessed.

*NOTE This event is intended for use only with LPMs where the banknote storage area is external.*

**12.2.22** Banknote acceptor mechanism is disconnected (type 1).

**12.2.23** Software validation or signature failure (type 3)
It is assumed that modification or unauthorized reading (or both) of the contents of the restricted components of the LPM or loading of unapproved software (or both) could have occurred.
The LPM shall be manually reactivated after the problem is rectified.

**12.2.24** Game play deactivated (type 4)
Deactivation of game play.

**12.2.25** Game play activated (type 1) (Activation includes reactivation of game play).
Activation and deactivation at normal commencement and conclusion of business require the generation of significant events.

**12.2.26** Enter Demonstration Mode (type 2/R).
Where demonstration mode is permitted by legislation

and the LPM enters this mode, it shall create and transmit a type 2/R event.

**12.2.27**   Exit Demonstration Mode (type 2/R)
Where demonstration mode is permitted by legislation and the LPM exits this mode, it shall create and transmit a type 2/R event.

**12.2.28**   Credit limit exceeded (type 1/R)
Machine credit that exceeds the limit specified in legislation.
Only the first occurrence during a particular customer's session shall be sent.

**12.2.29**   Maximum prize win (type 1/R)
Winning of a prize that equals the limit specified by legislation.

**12.2.30**   Printer failure (type 2)
The software shall register and react to any printer fault conditions, and shall allow the machine to complete the printing of the current ticket, if possible, and then pause printing and display an appropriate on-screen message until the problem has been solved and rectified.

## 12.3   Player and staff cards (if applicable)

**12.3.1**   Unauthorized card (type 1/R)
Use of a stolen or unauthorized staff machine card or player card.
The LPM card reader shall not accept an illicit card or a card that is not authorized for use at that specific time.

**12.3.2** Unauthorized staff PIN (type 1/R)
Incorrect PIN entered three times consecutively with a staff machine card. The system shall ensure that the card is blocked from any further use.

*NOTE It is not necessary to disable the LPM or the player interface.*

**12.3.3** Unauthorized player PIN (type 1)
Incorrect PIN entered three times consecutively with a player card.
The system shall ensure that the card is blocked from any further use.

*NOTE It is not necessary to disable the LPM or the player interface.*

**12.3.4** Banknote acceptance (if applicable)
Banknote reject state (type 1)

## 13 Connection with the Central Electronic Control System for Gaming Machines (CEMS-GM)

### 13.1 Interfacing Component

**13.1.1.** Each LPM shall equipped with an interfacing Component which may include a G2S Converter Board and/or Software. The Converter Board must be located either inside the logic area or outside the logic area in a separately installed converter board housing with separately lockable door.

**13.1.2.** The converter board will cater for following scenarios:

1.      G2S LPMs

2.      Multiple Legacy Gaming protocols including SAS.

## 13.2     Network and communication

The IPv4 Network addressing scheme is assumed as a basis for the bi-directional communication between the CEMS-machine and the gaming machines.

Communication between the LPM and the CEMS-machine shall be end to end encrypted with a level no less than 256 bit AES or other comparable method.   The encryption mechanism may use a fixed or a dynamic key. The LPM or its built-in converter board shall use the IGSA G2S protocol for the communication with the CEMS-machine. All the G2S Classes needed to cover the requirements laid down in this regulation must be fully supported.

The LPM Operator is responsible to ensure that its LPM or its built-in converter board is sending gaming data to the CEMS-machine using G2S Protocol.

## 13.3     Data transfer

The LPM or its built-in converter board shall have the capability of automatically and continuously transferring all mandatory data to the CEMS-machine:

a) auditing meters,

b) transactions,

c) significant events,

d) progressive jackpot information including Hit, display value per jackpot instance, jackpot meters per participating LPM,

e) control information about the gaming machines and its built-in converter board (authentication as required by regulatory bodies). Each LPM must be identifiable through unique serial number and identification number that uniquely identifies the LPM to the CEMS-machine

f) player tracking information (such as identity of the player, time and money spent at an LPM), and

g) system security and management data, including time synchronization data are communicated from the LPM to the CEMS-machine and is available for the specified accounting and reporting periods.

*NOTE Data transfer to be transferred can be subject of modification if required by the MRA and the technical specifications of the CEMS-machine*

## FOURTH SCHEDULE
[Regulations 7, 9(1) and 9(4)]

Technical Standards for Amusement Machine
(Ref: GRA/TS-AM/2024)

### Introduction

These technical standards are supplementary to and are not intended to derogate from any provisions in the Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations. In the event of any inconsistency, the provisions in Gambling Regulatory Authority Act (Act 9 of 2007 – 10 September 2007) and its subsidiary legislations shall apply.

The intention of this part of GRA/TS-AM/2024 is to place sufficient controls on software and operations to ensure that wagering is fair, safe, secure, reliable and auditable.

It is not the intention of this part of GRA/TS-AM/2024 to unreasonably

a) mandate a single solution or method of realizing an objective,
b) limit technology application of software,
c) limit creativity and variety of choice,
d) limit marketability, or
e) advantage any supplier or manufacturer of software.

Alternative implementations to the requirements
contained in this part of GRA/TS-AM/2024 will be
considered on a case-by-case basis.

CONTENTS

## 1 Scope

This part of GRA/TS-AM/2024 specifies the general hardware and software requirements required by the Mauritius Gambling regulatory authority (GRA) for amusement equipment to be used in venues that have site licenses for amusement machines

## 2 General notes

No general notes

## 3 Definitions and abbreviations

For the purposes of this document, the following definitions and abbreviations apply.

## 3.1 Definitions

### 3.1.1
**amusement machine**
means an electromechanical or other device which, on insertion of a coin , electronic credit, token or similar object or on payment of any other consideration, enables any person to play a game whereby the person, by reason of skill or of skill coupled with an element of chance, may win a prize which is limited to:
a) more than one opportunity to play a further game;
b) one or more non-cash prizes with a combined retail monetary value not exceeding MUR 500 or such other

amount as may be prescribed;

c) tickets or tokens redeemable for one or more non-cash prizes with a combined retail monetary value not exceeding MUR 500 or such other amount as may be prescribed; or

d) cash equivalent to the amount the player inserts in the machine to play;

*NOTE: No person shall install a multi-terminal amusement machine at his premises*

### 3.1.2
**cash**

a) means money, in notes or coins, of Mauritius or in any other currency; and

b) includes any cheque which is neither crossed nor made payable to order, whether in Mauritius currency or in any other currency;

### 3.1.3
**equipment**

any hardware, software, firmware, flashware or any combination in whole or in part of these intended for use in amusements

### 3.1.4
**game**

combination of events, including player interaction with the AM, whereby the person, by reason of skill or of skill coupled with an element of chance, may win a prize.

*NOTE 1   Definitions of "game" in legislation take precedence over this definition.*

### 3.1.5
**Inspector**

means a person employed as such by the Authority under section 14 (1) of the Gambling Regulatory Authority Act; and includes

   i.    any person authorised in writing by the Chief Executive under section 14(2) of the Gambling Regulatory Authority Act; and

  ii. the Director-General or any officer under the Mauritius Revenue Authority Act, authorised in writing by the Director-General to act as inspector

### 3.1.6
**legislation**

national legislation that deals with amusement, gambling, wagering, betting or horse-racing and any regulation or rule made in terms of such Act

### 3.1.7
**token**

circular element with an indicated monetary value, excluding legal tender such as coins, that might be put into AMs

### 3.1.8
**tokenization**

situation where the insertion of one coin, either gives rise to more than one credit being made available to the

player, or where more than one coin is required to be inserted in the CAD for the player to receive one credit

## 3.2     Abbreviations

| AM | amusement machine |
|-----|-----|
| CAD | Coin Acceptance Device |
| CDD | Coin Dispensing Device |
| EMC | electromagnetic compatibility |
| ESD | Electro-Static Discharge |
| I/O | input/output |
| MUT | Mauritius time |
| RFI | Radio Frequency Interference |

## 4     General requirements

## 4.1         Documentation

**4.1.1**   Each AM model shall have readily available and pertinent operating and service manuals.

**4.1.2**   The operating manual shall accurately depict the use of the AM in its operating environment, and shall provide sufficient detail and be sufficiently clear in its wording and diagrams to enable the relevant personnel to understand the manual with minimal guidance.

**4.1.3**   The service manual shall accurately depict the AM that it is intended to cover, and shall provide

sufficient detail and be sufficiently clear in its wording and diagrams to enable a competent person to perform repair and maintenance in a way that is conducive to the long-term reliability of the AM.

**4.1.4** Software documentation shall include an edit history providing details of all changes to code (what, why, who and when).

## 5 Electrical requirements

## 5.1 General requirements

**5.1.1** All connectors and wires shall be easily identifiable, both in the AM itself and on the circuit diagrams in the manuals.

## 5.2 Electro-Magnetic Compatibility (EMC) and Radio Frequency Interference (RFI)

**5.2.1** Electrical and mechanical parts and design principals of the AM shall not subject a player to any physical hazards. The independent test laboratory does not make any findings with regard to Electro-Magnetic Compatibility (EMC) or Radio Frequency Interference (RFI), as that is the responsibility of the manufacturer of the AM, or those that purchase it. Such EMC and RFI testing may be required under separate statute, regulation, law, or act and should be researched accordingly by those parties who manufacture or purchase said AM. The independent test laboratory does not test for, is not liable for, nor makes any findings related to these matters. However, during the

course of testing, the independent test laboratory shall inspect for marks, symbols or compliance reports indicating that a gaming device has undergone product safety or other similar compliance testing by some other party.

*Note: It is the manufacturer's responsibility to submit EMC and RFI reports to the TL. These reports shall be listed in the Test Report issued by the TL*

## 5.3    Electro-Static Discharge (ESD)

**5.3.1**    The independent test laboratory shall perform certain tests to determine whether or not an Electro-Static Discharge (ESD) impacts the integrity of a gaming device. ESD testing is intended to simulate techniques observed in the field that may be used in an attempt to disrupt the integrity of electronic gaming devices.

**5.3.2**    The AM shall comply with the following requirements related to ESD testing:
  a) The Random Number Generator (RNG) and random selection process shall be impervious to influences from ESD (if applicable); and
  b) Protection against ESD requires that the gaming device's conductive cabinet be earthed in such a way that static discharge energy shall not permanently damage or permanently impact the normal operation of the electronics or other components within the AM. AM's may exhibit temporary disruption when subjected to a significant external ESD with a severity level of 27kV air discharge. The AM shall exhibit a capacity to recover and complete any interrupted play

without loss or corruption of any control information or critical data following any temporary disruption.

## 6 Artwork requirements

### 6.1 General

**6.1.1** Artwork graphics shall not in any way or form be indecent or offensive.

**6.1.2** These requirements refer to all forms of artwork (i.e. anything that appears on the top panel, belly panel, buttons, on the area surrounding the display, and on the display itself). The combination of all relevant messages appearing anywhere on the artwork shall comply with these requirements.

**6.1.3** The artwork requirements apply equally to artwork displayed in physical form and in virtual form (for example, on a video display, as a holograph image and on a liquid crystal display (LCD) or similar display).

**6.1.4** If any game instructions are on the video screen only, they shall be accessible and visible without the need for credits to be inserted. This requirement does not apply during game play except where specific instructions might be required to proceed to the next stage of the game.

**6.1.5** The name of the game being played shall be clearly visible to the player.

**6.1.6** The coin or token denomination of the machine shall be clearly visible at all times, preferably near the coin slot. If the machine uses tokens or tokenization, the number of credits registered for each token or coin respectively shall also be displayed.

**6.1.7** All game instructions shall be in English and both grammatically and syntactically sound. Exceptions may be acceptable on a case-by-case basis.

**6.1.8** Game play and device usage instructions shall be stated unambiguously and shall not be misleading to the player.

**6.1.9** All statements on the artwork shall be true.

**6.1.10** Player selection options once the game has begun shall be clearly shown on the screen.

**7      Player control devices**

**7.1      Electronic player control devices**

**7.1.1** Electronic player control devices that have an impact on the game outcome shall:

a) ensure proper function and accuracy; and be able to be replaced or repaired in case of malfunction.
b) not be influenced by other device devices or any person other than the player (or players) using the device;

c) operate in accordance with applicable game rules; and
d) be clearly labelled in accordance with their function.

## 7.2 Non-electronic player control devices

**7.2.1** Non-electronic player control devices that have an impact on the game outcome shall function in accordance with the game rules and installed conforming the manufacturer's specifications.