



STANDARD SERIES

GLI-19:

Interactive Gaming Systems

(Suppliers)

Version: 1.0

Release Date: 31 May 2011



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ABOUT THIS STANDARD

This Standard has been produced by **TST, A GLI Company** for the purpose of providing independent certifications to suppliers under this Standard and complies with the requirements set forth herein.

A supplier should submit equipment with a request that it be certified in accordance with this Standard. Upon certification, TST, A GLI Company will provide a certificate of compliance evidencing the certification to this Standard.

Table of Contents

CHAPTER 1.....	6
1.0 Overview – Standards for Interactive Gaming Systems	6
1.1 Introduction.....	6
1.2 Acknowledgment of Other Standards Reviewed.....	7
1.3 Purpose of Technical Standards	8
1.4 Interpretation of this Document	8
1.5 Other Documents That May Apply.....	9
CHAPTER 2.....	10
2.0 Gaming Platform Requirements	10
2.1 Game Outcome.....	10
2.2 Gaming Platform	10
2.3 Gambling Information to be maintained by the Gaming Platform	13
CHAPTER 3.....	17
3.0 Player Account Management Requirements	17
3.1 Reserved.....	17
3.2 Player Accounts	17
3.3 Player Game Session	18
3.4 Responsible Gaming	19
CHAPTER 4.....	20
4.0 RNG Requirements	20
4.1 General Statement.....	20
4.2 Scaling	21
4.3 Choice of Algorithm.....	21
4.4 Hardware RNG.....	21
4.5 Software-Based RNG	21
CHAPTER 5.....	23
5.0 Game Requirements	23
5.1 Game Design.....	23
5.2 Game Artwork.....	32
5.3 Peer to Peer (P2P) Games.....	43
5.4 Game Play.....	44
CHAPTER 6.....	48
6.0 Jackpot (Progressive) Requirements	48
6.1 Introduction.....	48
6.2 Jackpot Design and Operation.....	48
CHAPTER 7.....	52
7.0 Information Systems Security (ISS) Requirements	52
7.1 Reserved.....	52
7.2 Administrative Controls	52
7.3 Technical Controls.....	54

Glossary 63

Appendix A: Submission Requirements 68

A.1 Introduction..... 68

A.2 Prototype (Full Submission) Submissions..... 68

A.3 Submissions of Modifications (Partial Submissions) to a Previously Certified Item..... 75

CHAPTER 1

1.0 Overview – Standards for Interactive Gaming Systems

1.1 Introduction

1.1.1. General Statement. In recent years, many jurisdictions have opted to ask for standards tests without creating their own standards documents. In addition, with technology changing almost monthly, new technology is not being incorporated quickly enough into existing standards due to the long process of administrative rulemaking. This document, *GLI Standard 19*, will set forth the technical Standards for Interactive Gaming Systems (IGS) used in an Internet environment.

1.1.2 Document History. We have listed below, and give credit to, agencies whose documents we reviewed prior to writing this Standard. It is the policy of **TST, A GLI Company** to update this document as often as possible to reflect changes in technology, testing methods, or cheating methods.

This document will be distributed FREE OF CHARGE to all those who request it. It may be obtained by downloading it from our website at www.gaminglabs.com or at www.tstglobal.com or can be requested by email at compliance@gaminglabs.com.

1.2 Acknowledgment of Other Standards Reviewed

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

- a) The ACT Office of Financial Management;
- b) The Alderney Gambling Control Commission;
- c) The Antigua & Barbuda Financial Services Regulatory Commission;
- d) The British Columbia Gaming Policy and Enforcement Branch;
- e) The Italy Autonomous Administration of State Monopolies;
- f) The New South Wales Department of Gaming and Racing;
- g) The Northern Territory Racing and Gaming Authority;
- h) The New Zealand Casino Control Authority;
- i) The New Zealand Department of Internal Affairs, Gaming Racing & Censorship Division;
- j) The Queensland Office of Gaming Regulation;
- k) The South African Bureau of Standards;
- l) The South Australian Office of the Liquor and Gaming Commissioner;
- m) The Tasmanian Department of Treasury and Finance, Revenue and Gaming Division;
- n) The United Kingdom Gambling Commission;
- o) The Victorian Casino and Gaming Authority;
- p) The Western Australian Office of Racing Gaming and Liquor.

1.3 Purpose of Technical Standards

1.3.1 General Statement. The Purpose of this Technical Standard is as follows:

- a) To eliminate subjective criteria in analyzing and certifying Interactive Gaming System (IGS) operation.
- b) To only test those criteria which impact the credibility and integrity of Interactive Gaming Systems from both the revenue collection and player's point of view.
- c) To create a standard which will ensure that games made available via the Internet are fair, secure, and able to be audited and operated correctly.
- d) To distinguish between local public policy and laboratory criteria. At TST, we believe that it is up to each local jurisdiction to set its own public policy with respect to gaming.
- e) To recognize that the evaluation of internal control systems (such as Anti-Money Laundering, Financial and Business processes) employed by the operators of the Interactive Gaming System should not be incorporated into this standard but left to the Regulatory Body of each local jurisdiction to assess as part of the licensing process.
- f) To recognize that non-gaming testing (such as Electrical Testing) should not be incorporated into this standard but left to appropriate test laboratories which specialize in that type of testing. Except where specifically identified in the standard, testing is not directed at health or safety matters. These matters are the responsibility of the manufacturer, purchaser, and operator of the equipment.
- g) To construct a standard which can be easily changed or modified to allow for new technology.
- h) To construct a standard which does not specify any particular method or technology for any element or component of an Interactive Gaming System. The intent is to allow a wide range of methods to be used to conform to the standards, while at the same time encouraging new methods to be developed.

1.4 Interpretation of this Document

1.4.1 No Limitation of Technology. One should be cautioned that this document should not be read in such a way that limits the use of future technology. The document should not be

interpreted that if the technology is not mentioned, then it is not allowed. Quite to the contrary, as new technology is developed, we will review this standard, make changes and incorporate new minimum standards for the new technology.

1.4.2 Software Suppliers and Operators. The components of an Interactive Gaming System, although they may be constructed in a modular fashion, are designed to work seamlessly together. In addition, Interactive Gaming System components may be developed to have configurable features, the final configuration of which will depend on the options chosen by the end operator. From a testing perspective, it may not be possible to test all of the configurable features of an Interactive Gaming System component submitted by a software supplier in the absence of the final configuration chosen by the operator.

This document has been designed to focus on software supplier specific test requirements. Because of the integrated nature of an Interactive Gaming System there are a number of requirements in this document which may apply to both suppliers and operators. In these cases, where testing is requested for a “white-label” version of the component, a specific configuration will be tested and reported. Additional testing will be required to confirm that the final configuration chosen by the operator meets the requirements of this document.

This document is not intended to be arbitrary in defining which parties are responsible for meeting the requirements of this document. It is left to the stakeholders of each system to determine how best to meet the requirements laid out in this document.

1.5 Other Documents That May Apply

1.5.1 General Statement. This standard covers the actual requirements for single-player and multi-player games being played through the use of various devices such as personal computers and mobile devices via the Internet. Currently there are no other documents, which may apply.

CHAPTER 2

2.0 *Gaming Platform Requirements*

2.1 **Game Outcome**

2.1.1 General Statement. All critical functions including the generation of the result of any game (and the return to the player) must be generated by the Gaming Platform and be independent of the end player device.

2.1.2 Communications Channel. Game outcome must not be affected by the effective bandwidth, link utilization, bit error rate or other characteristic of the communications channel between the Gaming Platform and the end player device.

2.2 **Gaming Platform**

2.2.1 General Statement. If the Gaming Platform is comprised of multiple computer systems at various sites, the Gaming Platform as a whole and all communication between its components must conform to these requirements.

2.2.2 Shut Down and Recovery. The Gaming Platform must have the following shutdown and recovery capabilities:

- a) The Gaming Platform must be able to recover from unexpected restarts of its central computers or any of its other components;
- b) The Gaming Platform must be able to perform a graceful shut down in the event of a simple power failure, and only allow automatic restart on power up after the following procedures have been performed as a minimum requirement:
 - i) Program resumption routine(s), including self tests, complete successfully;
 - ii) All critical files of the Gaming Platform have been authenticated using an approved method (ex. CRC, MD5, SHA-1, etc)
 - iii) Communication with all components necessary for Gaming Platform operation have been established and similarly authenticated.

- c) The Gaming Platform must be able to identify and properly handle the situation where master resets have occurred on other Gaming Platforms which affect game outcome, win amount or metering;
- d) The Gaming Platform must be able to recover all critical information from the time of the last backup to the point in time at which the Gaming Platform failure or reset occurred (no time limit is specified);
- e) The system must have the capability sufficient to ensure that player entitlements and audit-ability is available at all times.

2.2.3 Reserved.

2.2.4 Disabling of Gambling. The following requirements apply to the disabling and enabling of gambling on the Gaming Platform:

- a) The Gaming Platform must be able to disable or enable all gambling on command;
- b) The Gaming Platform must be able to disable or enable individual games on command;
- c) The Gaming Platform must be able to disable or enable individual player sessions on command; and
- d) When any gambling is disabled or enabled on the Gaming Platform an entry must be made in the audit log. The reason for any disable must be recorded in a protected audit log which does not necessarily have to be part of the Gaming Platform.

2.2.5 User Inactivity Timeout. If the Gaming Platform is not capable of polling the end player device to confirm a connection, it should implement user inactivity timeouts. .

2.2.6 Polling of End Player Devices. If the Gaming Platform is capable of polling, it must be able to poll end player devices on a time schedule basis and on command from a Gaming Platform operator, and:

- a) The Gaming Platform must be able to store the time and date of the last poll that occurred;

- b) Failure of an end player device to respond within 30 minutes must cause the session to be terminated; and
- c) The end player device must assume session termination if it fails to receive a response from the server within 30 minutes. The end player device must notify the player of session termination. No further game play is permitted until the Gaming Platform and the end player device establish a new session.

2.2.7 Malfunction. The Gaming Platform must:

- a) Not be affected by the malfunction of end player devices other than to institute the incomplete games procedures in accordance with these requirements; and
- b) Include a mechanism to void bets and pays in the event of a malfunction of the Gaming Platform itself if a full recovery is not possible.

2.2.8 Client Software. The following requirements apply to client software and the client-server interactions during gaming:

- a) The client and server software must be able to detect the physical location the user is trying to access the service from, and must not permit access while the player is in an area where this type of gaming is disallowed;
- b) The client software must not automatically alter any firewall rules to open ports that are blocked by either a hardware or software firewall;
- c) The client software must not access any ports which are not necessary for the communication between the client and the server;
- d) The client installation instructions must not require or instruct the end user to manually open up any ports on their firewall for any port that is not directly used in client-server communications;
- e) Players must not be able to transfer game files from one player to another through the client software, and all non-game files transferred in this manner must be authenticated by the Gaming Platform during the polling process and logged with the session information; and
- f) If the client software includes additional non-game related functionality, this additional functionality must not alter the game's integrity in any way.

2.3 Gambling Information to be maintained by the Gaming Platform

2.3.1 Reserved.

2.3.2 Session Information. For each gaming session (i.e.: customer login time to logout time), the information to be maintained, backed up and be available for inclusion in reports by the Gaming Platform must include:

- a) Unique player ID;
- b) Session start and end time;
- c) Relevant player device details such as IP address, browser version and/or client version;
- d) Total monies wagered for session;
- e) Total monies won for session;
- f) Funds added to account for session (time-stamped);
- g) Funds withdrawn from account for session (time-stamped);
- h) Where polling is implemented, time of last successful poll for session;
- i) Reason for session termination;
- j) Where polling is implemented, game play information for session; (i.e. games played, amounts bet, amounts won, jackpots won etc.);
- k) Player account balance at the start of the session;
- l) Current active sessions (e.g.: in progress, complete, etc.); and
- m) Time and date of interruption

2.3.3 Game Play Information. For each individual game played the information to be maintained, backed up and be available for inclusion in reports by the Gaming Platform must include:

- a) Unique player ID;
- b) Game start time according to the Gaming Platform;
- c) Account balance at start of game;
- d) Wager for game;
- e) Contributions to Jackpot pools (if applicable);
- f) Game status (in progress, complete, etc);
- g) Game result and outcome

- h) Jackpot win (if applicable);
- i) Game end time according to the Gaming Platform;
- j) Amount won;
- k) Account balance at the end of the game;
- k) The table number (if applicable) at which the game is played;
- l) The paytable used; and
- m) Game identifier and version.

2.3.4 Jackpot Information. The jackpot meter information must be transferred from the Jackpot Controller to the Gaming Platform at least every 60 seconds. As a minimum, the following jackpot software meters must be maintained, backed up and be available for inclusion in reports by the Gaming Platform:

- a) Total amount played for jackpots;
- b) Total amount of jackpots won;
- c) Total jackpot contributions made, (includes any diverted amounts);
- d) Total jackpot contributions won;
- e) Jackpot startups or other seeds which are not funded from player contribution;
- f) Current amount for each jackpot; and
- g) Current value of Jackpot contributions diverted.

2.3.5 Significant Event Information. The following requirements apply to the logging of significant event information by the Gaming Platform:

- a) Significant event information to be maintained, backed up and be available for inclusion in reports by the Gaming Platform must include:
 - i) Large wins in excess of the value specified by the licensing jurisdiction;
 - ii) Large transfers of funds (single and aggregate over defined time period) in excess of the value specified by the licensing jurisdiction;
 - iii) Changes made by the operator to game parameters;
 - iv) Changes made by the operator to jackpot parameters;
 - v) New jackpots created;
 - vi) Jackpot win occurrences;
 - vii) Jackpots retired;
 - viii) Player exclusions (including reason for exclusion, requests to lift exclusion, and actual lifting of exclusion);
 - ix) Events occurring in external Gaming Platforms which affect game outcome and win amounts (e.g. external jackpot hosts);
 - x) Irrecoverable loss of customer-related data; and
 - xi) Significant periods of Gaming Platform unavailability.
- b) External Gaming Platforms which affect game outcome or win amounts must maintain a log of significant events if they are not transferred immediately to the Gaming Platform;
- c) The Gaming Platform must be able to receive and store all significant events from external Gaming Platforms which affect game outcome or win amounts;
- d) The Gaming Platform must be able to provide a means to view significant events including the ability to search for particular event types; and
- e) The Gaming Platform must be able to prioritize events based on their significance (e.g., whether to log an event, raise an alarm or disable gaming).

2.3.6 Result Recall Mechanism. The following records must be maintained by the Gaming Platform to facilitate the recovery of incomplete games:

- a) The Gaming Platform must maintain records of any game that fails to complete and the reason why the game failed to complete. This information is to be treated as vital information to be recovered by the Gaming Platform in the event of a failure.
- b) Information sufficient to continue a partially complete game must be retained by the - Gaming Platform. This information is to be treated as vital information to be recovered by the Gaming Platform in the event of a failure.
- c) Bets associated with a partially complete game that can be continued must be held in a separate register until the game completes. Player accounts must reflect any funds held in the incomplete game register.
- d) In the event that a game cannot be continued due to a Gaming Platform action, all bets must be returned to the players of that game.

2.3.7 Data Backup. There must be a method to back up all critical data (which comprises financial, security and event information) with sufficient frequency to allow recovery in the event of an interruption.

CHAPTER 3

3.0 Player Account Management Requirements

3.1 Reserved

3.2 Player Accounts

3.2.1 Player Funds Maintenance. The following principles must apply to the maintenance of player funds:

- a) Player accounts on the Gaming Platform must be secured against invalid access or update other than by approved methods;
- b) All deposit, withdrawal, transfer or adjustment transactions are to be maintained in a Gaming Platform audit log;
- c) A deposit into a player's account made via a credit card transaction or other methods which can produce a sufficient audit trail, must not be available for betting until such time as the funds are received from the issuer or the issuer provides an authorization number to the operator indicating that the funds are authorized. The authorization number is to be maintained in a Gaming Platform audit log;
- d) Positive player identification, including any Personal Identification Number (PIN) entry or other approved secure methods, must be completed before the withdrawal of any monies held by the Gaming Platform can be made;
- e) Inactive accounts holding monies in the Gaming Platform must be protected against illicit access or removal;
- f) All transactions involving monies are to be treated as vital information to be recovered by the Gaming Platform in the event of a failure;
- g) Payments from an account are to be paid (including funds transfer) directly to an account with a financial institution in the name of the player or made payable to the player and forwarded to the player's address. The name and address are to be the name as held in

player registration details;

- h) Account statements must be sent to the registered address of the player either on request and to the player's e-mail address on a monthly basis. Statements must include sufficient information to allow the player to reconcile the statement against their own records to the session level;
- i) Any adjustments to player accounts on the Gaming Platform must be subject to strict security control and audit trail;
- j) It shall not be possible to transfer credits which represent a monetary value between two user accounts; and
- k) Credits that are used for "Play for Fun" games and hold no monetary value may be transferred between any numbers of user accounts.

3.3 Player Game Session

3.3.1 General Statement. A game session is started when a player logs in to the Gaming Platform. Game play which requires monetary payment can only occur during a game session. Where an operator provides access to multiple games from a games lobby, players may play more than one game during a game session.

3.3.2 Player Identification. Player identification must meet the following rules:

- a) A player must be provided with an electronic identifier such as a digital certificate or an account description and a password to start a game session; and
- b) The Gaming Platform must allow players to change their passwords, and should remind them to on a regular basis.

3.3.3 Game Session End.

- a) A game session finishes if:
 - i) The player notifies the Gaming Platform that the session is finished (e.g. "logs out");
 - ii) A user-inactivity timeout is reached;
 - iii) The Gaming Platform host does not get a response to polls within 30 seconds to the end player device, if applicable; or

- iv) The operator terminates the session.
- b) Where the operator terminates a session, a record must be written to an audit file that includes the termination reason;
- c) The Gaming Platform must attempt to send a session finished message to the end player device each time a session is terminated by the Gaming Platform

3.4 Responsible Gaming

3.4.1 Last Log in Time Display. When a player logs in to the gaming platform, the last time they logged in must be displayed.

CHAPTER 4

4.0 *RNG Requirements*

4.1 **General Statement**

4.1.1 The Random Number Generator (RNG) and its methodology must be based on a pseudo random number generating algorithm or be hardware based, and be cryptographically strong at the time of submission. Where more than one instance of an RNG is used in a Gaming Platform, each instance must be separately evaluated and certified. Where each instance is identical, but involves a different implementation within game(s) / application(s), each implementation must also be separately evaluated and certified.

Any RNG outcomes used for game symbol selection / game outcome determination must be proven to:

- i) Be statistically independent,
- ii) Be fairly distributed (within statistically expected bounds) over their range,
- iii) Pass various recognized statistical tests, and
- iv) Be non-predictable, even from an attacker who has knowledge of the algorithm, the algorithm's implementation within the game(s) / application(s) to which it is connected, and the initial value used to seed the algorithm in the first instance.

4.1.2 Game symbol selection / game outcome determination must not be influenced, affected or controlled by anything other than numerical values derived from the RNG in conjunction with the rules of the game. Note that this does not prohibit metamorphic games or Progressive Jackpots determined by means other than individual game outcomes which are considered on a case-by-case basis. As game symbols are selected / game outcomes are determined, they must be immediately used as directed by the rules of the game (i.e.: they are not to be discarded due to adaptive behaviour by the game). Where the rules of the game require a sequence of game symbols / game outcomes to be set up in advance, these entities must not be re-sequenced except as provided by the rules of the game.

4.2 Scaling

4.2.1 The methods of scaling (i.e.: converting raw RNG outcomes of a greater range into scaled RNG outcomes of a lesser range) must be linear, and must not introduce any bias, pattern or predictability. The scaled RNG outcomes must be proven to pass various recognized statistical tests.

4.3 Choice of Algorithm

4.3.1 The RNG can either be software-based, hardware-based, or a combination of both, at the discretion of the Software Supplier. However, the final implementation must comply with the requirements of this document.

4.4 Hardware RNG

4.4.1 Owing to their physical nature, the performance of hardware-based RNGs can deteriorate over time. The failure of a hardware-based RNG could have serious consequences for the game(s) / application(s), as games may become predictable or exhibit non-fair distribution. Accordingly, if a hardware-based RNG is used, some form of dynamic / active, real-time testing of the output is required in the software, such that game play is disabled when an output testing failure is detected.

4.5 Software-Based RNG

4.5.1 The following requirements apply only to software-based RNGs.

- a) **Period.** The period of the RNG, in conjunction with the methods of implementing the RNG outcomes, must be sufficiently large to ensure that all game outcome combinations / permutations are possible for the given game(s) / application(s).
- b) **Range.** The range of raw values produced by the RNG must be sufficiently large to provide adequate precision and flexibility when scaling and mapping.

- c) **Seeding/Re-Seeding**. The methods of seeding / re-seeding implemented in the RNG must ensure that all seed values are determined securely, and that the resultant sequence of game outcomes is not predictable. Unless proven to have no adverse effect on the randomness of the RNG outcomes, or actually improve the randomness of the RNG outcomes, seeding and re-seeding must be kept to an absolute minimum. If for any reason the background cycling / activity of the RNG is interrupted, the next seed value for the RNG must be a function of the value produced by the RNG immediately prior to the interruption.
- d) **Background Cycling/Activity**. In order to ensure that RNG outcomes cannot be predicted, adequate background cycling / activity must be implemented in between games. Wherever a game outcome is made up of multiple mapped RNG values, background cycling / activity must be implemented during the game (i.e.: in between the selection of each mapped RNG value) in order to ensure that the game outcome is not comprised of sequential mapped RNG outcomes. The rate of background cycling / activity must be sufficiently random in and of itself to prevent prediction.

CHAPTER 5

5.0 *Game Requirements*

5.1 **Game Design**

5.1.1 Game Cycle. The following items describe the Game Cycle:

- a) A game commences when a player commits to a wager by performing an action which begins game play (e.g. pressing a “Play”, “Deal” or “Spin” button);
- b) A game is considered completed when:
 - i) The player cannot continue playing without committing additional credits from the player’s account, and
 - ii) Has no credits at risk.
- c) The following are all considered to be part of a single game, i.e.) have to be finished before the game is considered completed:
 - i) Any feature, bonus or free games triggered from within the main game;
 - ii) Any metamorphic features implemented in the game;
 - iii) Games where the rules permit wagering of additional credits, for example Blackjack Insurance or the second part of a two part Keno game; and
 - iv) Gamble features (for example, Double up).

5.1.2 Game Fairness. The following requirements outline the objectives for game fairness:

- a) A game shall not be designed to give the player a false expectation of better odds by misrepresenting any occurrence or event;
 - b) Each time a game element (base, primary, feature, bonus or free) is played, the player shall have a chance of obtaining any of the results displayed on the appropriate pay table of that game;
 - c) Determination of events of chance must not be influenced, affected or controlled by anything other than numerical values derived in an approved manner from the approved Random Number Generator (RNG) in conjunction with the rules of the game;
 - d) Except as provided by the rules of the game and for metamorphic games, events of
-

chance within games must be independent of (i.e. uncorrelated with) any other events within the game or any events within previous games.

NOTE: Games that are not completely independent of players' history may not be acceptable in some jurisdictions.

- e) Where a game is represented or implied to include a simulation of a real-life physical device (e.g. the spinning of reels, the spinning of wheels, the rolling of dice, the tossing of coins, etc.), the behavior of the simulation must follow the expected behavior of the real-life physical device. That is:
 - i) For games that intend real-life physical simulation, the visual representation of the simulation must correspond to the features of the real-life physical device;
 - ii) The probability of any event occurring in the simulation that affects the outcome of the game must be equivalent to the real-life physical device;
 - iii) Where the game simulates multiple real-life physical devices that would normally be expected to be independent of one another, each simulation must be independent of the other simulations; and
 - iv) Where the game simulates real-life physical devices that have no memory of previous events, the behavior of the simulations must be independent of (i.e.: not correlated with) their previous behavior, so as to be non-adaptive and non-predictable in practice.
- f) Game fairness objectives for games such as horse/car/animal racing, golf/football, virtual reality, etc. shall be assessed on a case by case basis applying the general game fairness objectives specified above.

5.1.3 Game Rules. The following requirements apply to game rules displayed to the player:

- a) The rules of the game must be available to the player directly on the game interface or accessible from the game interface via a hyperlink;
- b) All game rules and payable information should be accessible by a player prior to committing to a bet;
- c) The published game information must be sufficient to explain all of the applicable rules and how to participate in the game;
- d) The rules of the game shall not be unfair or misleading;

- e) The game must operate and interact with the player in accordance with the rules displayed to the player; and
- f) A rule change constitutes a different game, although variations to the maximum number of credits bet per game (and/or lines per game) are permitted. This requirement does not preclude implementations of games with multiple parts or features provided that the rules are clear to the player.

5.1.4 Result Determination Methodologies. The following requirements apply to the game results and the determination methodologies:

- a) For any game made available, result determination for each individual play within a game shall:
 - i) Be for all attainable combinations of the mapped symbol set (except for random awards);
 - ii) Be clearly specified in the artwork (or accessible to the player via a clearly apparent hyperlink);
 - iii) Be a consequence of one of the result determination methodologies described herein;
 - iv) Have a theoretical Percentage Return to Player (%RTP) not less than that specified in the game rules; and
 - v) Have a maximum prize not greater than that specified in the game rules.
- b) The theoretical %RTP shall be not less than the minimum %RTP specified in the game rules.
- c) The minimum %RTP shall be met when playing at the lowest end of a non linear payable (e.g. 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, then the game is unacceptable.)

***NOTE:** 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.*

- d) Where a progressive prize is offered, it must be implemented such that the “start-up value + increment rate” of the progressive ensures that the minimum return requirement stated

above is realized.

- e) The result in game play can be determined in the following ways:
 - i) Pure chance;
 - ii) Mental skill
 - iii) Physical skill
 - iv) Any combination of the above;
- f) 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 random number generator (RNG).
- g) A play shall not alter or modify the presentation of mapped symbols or artwork, 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;
- h) Games that have a component of skill (e.g. Draw Poker and Blackjack) shall meet the following requirements:
 - i) The player return for an optimal strategy, based upon the information available to the player in the game rules, shall not be less than the %RTP displayed to the player;
 - ii) Any strategy advice or automatic holds shall be fair and not misleading to the player and not represent a poor choice and, if followed exactly, shall ensure that the theoretical minimum RTP shall be met;
 - iii) The player shall be able to override the automatic hold; and
 - iv) The automatic hold strategy shall be used in calculating the game's %RTP.

5.1.5 Game History. A 'replay last game' facility must be provided, either as a re-enactment or by description. The replay facility shall provide all information to fully reconstruct the last ten games of the current session, and must provide the following information (at a minimum):

- a) The date and time the game was played;
- b) The display associated with the final outcome of the game, either graphically or via a clear text message;
- c) Total player cash / credits at start of play;
- d) Total player cash / credits at end of play;

- e) Amount bet including any multipliers;
- f) Total cash / credits won for the prize resulting from the last play (including Progressive Jackpots);
- g) Any player choices involved in the game outcome, and
- h) Results of any intermediate game phases, such as gambles or feature games.

5.1.6 Game Features. The following requirements apply to games with features:

- a) 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 conclusion of the base game which led to the feature;
- b) A game may offer random awards, provided that the award value complies with that specified by the game rules; and
- c) Initial entry to a feature activity shall be conditional upon an immediately preceding occurrence of a triggering event available through the primary game (ex. Win trigger, mystery trigger, community event).

5.1.7 Gamble Option. The following requirements apply only to games which implement some form of gamble option upon completion of the base game (e.g.: “double-up”, “triple-up”, etc...);

- a) The gamble prize limit (if applicable) for a particular game, and the maximum number of gambles available, must be clearly stated. Note that where wording indicating the maximum prize that can be won exists, then it must be possible to win this prize;
- b) When the gamble option is discontinued automatically before reaching the maximum number of gambles available, the reason must be clearly displayed;
- c) All references to gamble must use words such as “gamble” or “double up”, which cannot be misinterpreted to indicate some other feature;
- d) Any unusual game conditions during which the gamble option cannot be accessed must be specified;
- e) If a gamble option offers a choice of multipliers, it must be clear to the player what the range of choices / payouts is; and

- f) Once the player has selected a multiplier, it must be clearly stated on the screen which multiplier was selected.

5.1.8 Games with Metamorphic Features. Games with features that are not completely independent of the player's history (i.e. metamorphic) shall meet the following rules:

- a) Display clearly to the player which game rules apply to the current game state;
- b) The game rules must be accessible at anytime from the current game screen;
- c) Display to the player sufficient information to indicate the current status towards the triggering of the next metamorphosis of the game (e.g. 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);
- d) 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 return to player based on past payouts);
- e) 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 like tokens shall not deteriorate as the game progresses (e.g. for identical tokens it is not permitted that the last few tokens needed are more difficult to obtain than the previous tokens of that kind);
- f) The game's player return over the cycle of both the metamorphic and non-metamorphic part of the game shall conform to the minimum theoretical return to player minimum %RTP;
- g) 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:
 - i) Provide a means where winnings on the player win display can be bet (via the credit display) to allow for instances where the player has an insufficient credit balance to complete the feature;
 - ii) Transfer all credits on the player win display to the player credit display upon

completion of the feature.

5.1.9 Card Games. The following requirements apply to all games which depict cards being drawn from a deck:

- a) At the start of each game/hand, cards shall be drawn fairly from a randomly shuffled deck consisting of the full set of cards applicable to the game depicted, unless the specific rules of the game do not allow for the shuffle of the deck after every game according with 5.1.9(e);
- b) Once cards are removed from the deck they shall not be returned to the deck except as provided by the rules of the game depicted;
- c) The deck shall not be reshuffled except as provided by the rules of the game depicted,
- d) As cards are removed from the deck, they shall be immediately used as directed by the rules of the game (i.e. are not to be discarded due to adaptive behavior by the gaming device); and;
- e) The artwork shall clearly state if the rules of the game do not allow for the shuffle of the deck after every game. In this instance, the artwork shall indicate when shuffles actually do occur.

5.1.10 Ball Drawing Games. The following requirements apply to games which depict balls being drawn from a barrel (e.g. Keno) are as follows:

- a) At the start of each game only balls applicable to the game are to be depicted;
- b) Once balls are removed from the barrel they shall not be returned to the barrel except as provided by the rules of the game depicted;
- c) The barrel shall not be re-mixed 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. are not to be discarded due to adaptive behavior by the gaming device).

5.1.11 Maximum Prize. The maximum prize paid out by gaming software shall be as specified in the game rules and shall be displayed within the help screens for that particular game.

5.1.12 Maximum Stake. The maximum stake shall be as specified in the game rules and shall

be displayed within the help screens for that particular game.

5.1.13 Player Status During Game Play. During a multi-player game, the software must allow for a user to set an “Away from computer” status which could be utilized if the player needs to step away for a moment.

- a) The “Away from computer” status must disallow all play, and also cause the player’s turn to be automatically skipped during any round of play which takes place while this status is active.
- b) If a player sets an “Away” status during the middle of a round of play, they will automatically forfeit their play for that round (e.g. for a round of poker, the software shall automatically fold the player’s hand during the next round of betting).
- c) If a player performs any game sensitive action within the game window while in an “Away” state (i.e. typing something into the chat box, selecting an amount to bet, etc...), the state shall be removed and the player will be enrolled into the next round of play. Non-game sensitive actions, such as accessing the help menu from the game window do not require this status to be removed.
- d) If no action has been taken by the player in the game window within the last 10 minutes, they shall be automatically placed into the “Away from computer” state.
 - i) Other actions performed on the end user’s computer which do not affect the game software must not be included with the status check (i.e. the player opens up a web browser).
 - ii) If a player has been in “Away” status for over 30 minutes, the player must be automatically removed from the table they are currently enrolled in, and be returned to the game lobby or equivalent.
- e) Single player games may implement the use of a pause button.
 - i) A pause button must not halt any actions being performed by the game server or any communications between the client and server.
 - ii) During this time, the player’s account balance may not be altered due to actions related to the paused game (i.e. additional bets, mystery awards, other wins, etc...).

- 1) The player may add funds to their account via a secure method during this time.
- 2) Any additional funds added during a paused game session must not appear in the player's credit balance until:
 - The funds have been authorized by the financial institution,
 - The game session has been resumed, and
 - The current game cycle has ended.
- iii) It must be clear to the player that their game has been paused.
- iv) It must be clear to the player how to resume a game from a paused state.
- f) All of the aforementioned items must be clearly explained within the help screens of the game.

5.1.14 Multi-Game Software. The below rules apply to software with multiple selectable games spawning from one main executable client:

- a) There shall exist a Game Selection Menu where the full amount of the player's credit balance is displayed either in the local currency or in credits.
- b) The methodology employed by a patron to select and deselect a particular game for play on a multi-game gaming client shall be clearly explained to the patron in the help screens, and be easily followed. The client software shall clearly inform the patron of all games available at that time and offer them for selection.
- c) Software clients 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.

5.1.15 Multi-Line Games. The following rules apply to information on Multi-Line games:

- a) Each individual line to be played shall be clearly indicated by the gaming device so that the player is in no doubt as to which lines are being bet on; and
- b) The winning payline(s) shall be clearly discernable to the player. (e.g., on a video game it may be accomplished by drawing a line over the symbols on the payline(s) and/or the flashing of winning symbols and line selection box. Where there are wins on multiple lines, each winning payline may be indicated in turn.).

5.2 Game Artwork

5.2.1 General Statement. The following requirements apply to the game artwork, which includes all written, graphical and auditory information provided to the player either directly from the game interface or from a page accessible to the player from the game interface via a hyperlink located in a conspicuous location. If the player leaves the game screen to access the game rules, then it should be easily apparent how he can return to the game. The combination of all relevant messages appearing anywhere on the artwork shall comply with these standards:

- a) All statements on the artwork shall be true;
- b) Any game instructions shall be accessible and visible without the need for credits to be inserted or staked;
- c) Game play and device usage instructions shall be stated unambiguously and shall not be misleading to the player;
- d) As a minimum the player shall be able to view a tabulated display of the payable that shows all winning combinations and their payouts when no game is in progress;
- e) The pay scale on the artwork shall correspond to the pay scale used in the mathematical treatise;
- f) The outcome of each game shall be displayed for a reasonable length of time;
- g) The display of the result of a game outcome shall not be misleading or deceptive to the player (e.g. shall not improperly indicate a near-miss);
- h) There shall be sufficient game instructions to allow a player to determine the correctness of prizes awarded;
- i) If the artwork contains game instructions specifying a maximum win then it shall be possible to win this amount from a single game (including features or other game options);
- j) 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;
- k) Artwork graphics should not be indecent or offensive in any way or form;
- l) All game instructions should be in English or in the official language of the jurisdiction and be both grammatically and syntactically sound. All game instructions on the artwork

should be easily interpreted, clearly visible, not ambiguous, and sufficient to explain all game rules.

- m) The following principles must be followed where games are provided in different language versions:
 - i) Each version must provide the same rates of return to the player;
 - ii) Each version must be consistent with the instructions for that version;
 - iii) All game information must be provided in the language specified for that version
 - iv) The game information must be the same across all language versions.
- n) The game must provide information to enable the player to resolve complaints with the operator in the first instance and, failing this, the ability to notify the jurisdiction of complaints against the operator.

5.2.2 Game Information. The following game information shall be visible or easily accessible to the player at all times from either a help menu or website:

- a) The name of the game being played;
- b) Instructions on how to play, including a payable for all prizes and special features;
- c) Restrictions on play or betting such as any play duration limits, maximum win values, etc;
- d) The player's current credit balance;
- e) The current bet amount. This is only during the base game or if the player can add to the bet during the game;
- f) The denomination of the bet and, where applicable, any tokenization implemented in the game;
- g) All possible winning outcomes, or be available as a menu item or on the help menu;
- h) Win amounts for each possible winning outcome, or be available as a menu or help screen item;
- i) The amount won for the last completed game (until the next game starts or betting options are modified);
- j) The player options selected (e.g., bet amount, lines played) for the last completed game (until the next game starts or a new selection is made);
- k) Initial player selection options are to be described (e.g. selection of a runner in a horse

race should identify name, number and expected payout). Player selection options once the game has commenced should be clearly shown on the screen;

- l) The winning amount for each separate wager and total winning amount are to be displayed on the screen;
- m) The minimum theoretical %RTP and explanation on how calculated (e.g. Total prizes for game cycle divided by total number of different outcomes in game cycle).

NOTE: This requirement does not apply to games where there is sufficient information available to the player to enable the player to readily and easily determine the house edge or percentage return to player.

- n) Whether there are contributions to jackpots (“progressives”) and the way in which the jackpot operates, for example, whether the jackpot is won by achieving a particular outcome; and
- o) Any rules pertaining to the metamorphosis of games, for example, the number and type of tokens that need to be collected in order to qualify for a feature or bonus round and the rules pertaining to that bonus round where they may otherwise differ from the base game.
- p) The following information must be readily available to the player (i.e. displayed directly on the game "page" or accessible via a hotlink on the page):
 - i) Information on responsible gambling, including instructions on how to limit bets per game and/or session and invoke self-exclusion arrangements; and
 - ii) Information on contact points for problem gambling services.

5.2.3 Paytable Information. The following rules apply to the payable information displayed to the player:

- a) Paytable information shall be clearly identified and shall accurately state the rules of the game and the award that will be paid to the player when the player obtains a specific win.
- b) The payable information shall clearly indicate whether awards are designated in denominational units, currency, or some other unit.
- c) The payable information reflects any change in award value, which may occur in the course of play. This may be accomplished with a digital display in a conspicuous location in the frame, and the game must clearly indicate such.
- d) All payable information should be able to be accessed by a player, prior to them

committing to a bet. The table information shall not be certified if the information is inaccurate or may cause confusion. The “reasonable player” standard shall be used for evaluation;

- e) 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.
- f) For 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:
 - i) The definition of the event that leads to the accumulation of tokens;
 - ii) A description of how many tokens are accumulated with each occurrence of the event;
 - iii) A description of how many tokens are required to trigger the feature;
 - iv) An indication of how many tokens are currently accumulated;
 - v) 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;
 - vi) If the accumulation of tokens may lead to free games, the number of possible lines and credits per line that are to be wagered during the free games; and
 - vii) Game rules when further tokens are not accumulated during the feature sequence for events that normally would qualify to earn tokens.

5.2.4 Winning Patterns. The winning patterns for the game displayed on the artwork shall meet the following rules:

- a) All winning combinations relevant to the particular point in time of a game should be clearly displayed or should be accessible to the player from the game interface. All non-defined combinations are assumed to be non-winning.
- b) If generic winning patterns (graphical representation of how the symbols of the same kind are to appear) are only represented graphically (without the aid of a verbalized explanation), then they should be supplemented with numbers to indicate how many correct symbols each pattern corresponds to; except for unusual winning patterns (e.g. X_X_x_X_X) where numbers shall not be displayed and the pattern shall be positioned

in proximity to the prize.

- c) The trigger combination(s) and all other conditions that have to occur in order to trigger a feature game, should be specified unambiguously. The action of the game when feature trigger patterns occur during the feature (e.g. free games) is to be clearly stated on the artwork (e.g. further triggers, bonus payout and/or no further trigger).
- d) Winning patterns that are not "left to right" or "right to left" or "any" should be clearly explained, preferably with pictorial representations.
- e) 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, except in cases of animation during play or as a part of the game rules.

5.2.5 Game Specific Requirements. The following requirements apply to the display of artwork specific to particular game types or game elements, in addition to the general requirements provided above:

a) Card Games.

- i) Card faces are to clearly display the card value (e.g. it shall be obvious which is a Jack and which is Queen);
- ii) Card faces are to clearly indicate the suit (Hearts and Diamonds should be red, Clubs and Spades black);
- iii) Jokers are to be easily distinguishable from all other cards.

b) Blackjack.

- i) Insurance rules are to be clearly explained if Insurance is available.
- ii) Pair Split rules shall be explained. Areas to be addressed are:
 - A) Split aces have only one card dealt to each ace, if this is the game rule;
 - B) Further splits, if available; and
 - C) Double-down after splits, if available.
- iii) Double-down rules are to be clearly explained including limitations of which totals may allow a double down to be selected.
- iv) The current total of all hands, including the Dealer's total, shall be displayed during and at the end of the game.

- v) The term "Bust" or the equivalent may be used to indicate a hand whose total has exceeded 21.
 - vi) Dealer play rules shall be clearly explained including special treatment of a soft 17 count, if any. Any limits on the number of cards that may be drawn by Player and/or Dealer are to be explained including winners declared (if any) when the limit is reached (e.g. Five Under wins).
 - vii) Surrender Rules are to be explained, if any exist.
 - viii) If the player loses on "Dealer Push" this is to be clearly explained.
 - ix) "London Deal" rules are to be clearly explained, if they exist.
 - x) Winning hands shall be clearly labeled as to the win category, e.g. "Blackjack", "Six Under" or "Push".
 - xi) If Pair Splits have occurred, the results for each hand are to be shown (total points, resultant win or loss category, amount won, amount wagered).
 - xii) Special rules, if any, shall be clearly explained.
 - xiii) All player options that are available at any point in time are to be shown on the artwork.
- c) Poker.
- i) The game rules shall provide clear indication if Stud Poker rules apply. Common Draw Poker is assumed, if nothing is stated.
 - ii) The game rules shall provide a definition of all winning combinations, e.g. Royal Flush without Wild Cards, Four of a kind "Jacks or better", Four Deuces (when Deuces are wild), etc.
 - iii) Wild card rules shall be clearly explained, e.g. Jokers Wild or Deuces Wild.
 - iv) Held and non-held cards, including recommended holds (if implemented), in Draw Poker or the equivalents shall be clearly displayed on the game screen, and the method for changing Holds clearly displayed to the player.
 - v) At the completion of the game the winning hands shall be labeled with the winning combination defined in the game rules or game artwork.
 - vi) All special rules outside the scope of common Poker shall be clearly explained.
 - vii) When player options outside the scope of common Poker are currently

available, they shall be clearly explained on the artwork.

d) Simulated Races.

- i) All participants in the race shall have characteristics that make it unique in appearance (e.g. number, jockey colors).
- ii) The result of the race shall be clearly obvious and not open to misinterpretation.
- iii) If prizes are to be paid for combinations involving 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 (e.g. Result 8-4-7).
- iv) Each meaningful result position shall be available for display in all last-game replays.
- v) The rules for alternative wagering options, e.g. quinella, and the expected payouts are to be clearly explained on the artwork.

e) Scratch Tickets.

- i) A description of all player options and steps required to complete the game shall be shown on the artwork.
- ii) Details of how payouts are won and their amounts shall be shown on the artwork, e.g. three matching scratched symbols win that prize.
- iii) All rules for symbols that may substitute in winning patterns shall be displayed on the artwork.

f) Roulette.

- i) Each "Zero" used shall be uniquely labeled (e.g. "0", "00", "000").
- ii) The simulated Roulette wheel shall be in the identical format as a standard casino wheel (including colors of landing locations and position of numbers) with the exception that the position of "Zeroes", if more than one exist, in which case the "Zeroes" may be placed arbitrarily.
- iii) A payable or description of all available wagers and their payouts shall be accessible by the player while not in game play.
- iv) The method of selecting individual wagers is to be explained by the artwork.
- v) The wager(s) already selected by the Player are to be displayed on the screen.

- vi) The simulated ball spin shall result in a location that unambiguously determines the winning number.
 - vii) Variations from standard roulette will be considered on a case-by-case basis.
- g) Dice Games.
- i) Each die face shall clearly show the number of spots.
 - ii) If it is the intent of the game to simulate live play of a dice game, a simulated die shall be of the same layout as a standard die (e.g. the 1 and 6, 2 and 5, and 3 and 4 respectively shall be on opposite faces).
 - iii) It shall be obvious which is the up face on each die after the dice are thrown.
 - iv) The result of each die shall be clearly visible or displayed.
 - v) 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.
 - vi) All possible wagering options available and obtainable at any point in time shall be displayed on the artwork.
 - vii) Variations on dice games will be considered on a case-by-case basis.
- h) Reel Games.
- i) The number of symbols that are required to appear in the "*reels display window*" in order to trigger each award should be indicated. These numbers should 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.
 - ii) If the awards for multiple credits staked are tabulated, then the number of credits bet required for each award should be placed in a location that clearly indicates which prize applies to which multiplier. Each such number should have associated with it the word "credits" or an equivalent.
 - iii) All occurrences of the scattered symbols should be labeled with the word "scatters" (or an equivalent) in all game rule and payable screens where they appear.
 - iv) 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.

- v) The artwork shall appropriately state that all wins occur on selected lit lines (and if applicable - “except scatters”) or equivalent.
- vi) Where the player may hold one or more reels for a second chance to improve the result, 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 rules stating 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:
 - Which reels are to be held e.g. first two reels;
 - Whether held reels occur on winning or non-winning patterns; the specific line where the trigger combination shall occur, if any (e.g. "ON THE CENTER LINE"), or scattered if that is the actual requirement of the game; and
 - If a partial number of reels (e.g. 2, 3 or 4 reels) are held for some criteria, it shall be clearly stated what happens when the criteria forms part of a larger pattern (e.g. what happens when all 5 reels meet said requirement).
 - C) If the trigger is a winning pattern and the pattern does not pay during re-spins, this shall be clearly stated on the artwork;
 - D) The rules for extensions or termination of the re-spin sequences including additional held reels, e.g. when there are improvements to the original held combination(s), are to be clearly explained on the artwork.
 - E) The method for changing holds shall be clearly displayed to the player;
 - F) If the player shall wager additional credits to participate in the hold reels phase of the game this is to be stated; and
 - G) Display that the player is able to hold or release reels.

- vii) If it is possible to bet on multiple lines and it is not clearly obvious which reel positions are part of each of the possible lines, then the additional lines shall be clearly displayed on the artwork, and appropriately labeled. The additional lines shall either be shown on the displayed artwork or be available for display on a help or 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 labeled.
- i) Keno and Bingo Games.
- i) 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.
 - ii) Any special rules, which are outside the standard game of Keno and Bingo, shall be clearly explained.
 - iii) All of the player's selections shall be clearly identified on the screen.
 - iv) The balls drawn shall be clearly identified on the screen.
 - v) The game shall highlight balls drawn that match the player's selections (i.e. "Hits").
 - vi) Special hits, if any, are to be clearly identified.
 - vii) The screen shall provide clear indication of how many spots were selected and how many hits have occurred.
 - viii) Rules for purchase of additional features of the game, if any, are to be explained.
 - ix) The artwork shall clearly state how the player makes or changes selections.
Areas to be addressed are:
 - How individual numbers are picked;
 - How individual numbers are cleared; and
 - How all selections are cleared.
- j) Free Games.
- i) Additional payouts for non-winners during the free game sequences, if any, are

to be displayed on the artwork.

- ii) Any multipliers for prizes, special prizes, substitutes and other special rules during free games, are to be displayed on the artwork;
 - iii) A clear display of an accumulated win amount is required during each stage of the free games if the game does not directly add wins to the player account
 - iv) If more than one free game is offered, the number of free games that has occurred or the number remaining shall be displayed; and
 - v) Appropriate game instructions defining the number of possible lines and credits per line that can be wagered during the free games.
- k) Metamorphic Games.
- i) All instructions for the game including the differences between the main game and the metamorphic game are to be stated (e.g. <character> appearing anywhere in window pays the original prize which started the feature);
 - ii) An indication shall be stated that the number of lines and/or number of credits wagered during the metamorphic sequence may not exceed the wager of the game or games which triggered the feature if that is the rule of the feature;
 - iii) Any special prizes, substitutes, multipliers or similar rules during the metamorphic sequence shall be clearly stated on the artwork; and
 - iv) If the metamorphic sequence consists of more than one feature game, the number of games in the metamorphic sequence that has occurred or the number remaining (or the total number) shall be displayed.
- l) Feature Games.
- i) Criteria for entry to further bonus features as well as the initial entry are to be clearly stated;
 - ii) All instructions and player choices for the bonus feature are to be clearly stated;
 - iii) A display of total amounts won, including all bonus prizes won in bonus features, shall be available at the end of each stage of the game including second screen animations. and
 - iv) If bonus prizes are multiplied the artwork shall clearly state whether they are

multiplied by credits staked per line or total where appropriate.

5.3 Peer to Peer (P2P) Games

5.3.1 General Statement. P2P game rooms are those environments which offer players the opportunity to gamble with and against each other. In these environments, the operator usually does not engage in the gambling event as a party (e.g. house banked gaming), but usually provides the gambling service or environment for use by its players, and takes a rake, fee, or percentage for the service.

5.3.2 P2P Game Rules. The following requirements apply to P2P games:

- a) The operator must clearly describe the operator’s Terms and Conditions used for registering an account.
- b) The customer should not be allowed to play against himself where the customer has an ability to influence the outcome of the game.
- c) A player may only occupy one seat at any individual table.
- d) The operator’s collusion policy, including possible sanctions must be clearly described to the player.
- e) The operator must provide warnings about how bots can affect play, so that customers can make an informed decision whether to participate.
- f) In order to avoid collusion by players sitting at both ends of the table or in some other supportive seating arrangement, random table allocation is vital in both sit-n-go and multi-table tournaments. However, random table allocation is not required on ring tables, as players prefer to choose their playing partners;
- g) The rules must clearly describe the procedure in case of player disconnection from the network server during a game (e.g. internet connection outage, PC crash, etc.)
- h) The house percentage and other gambling service fees (“rake”), must be clearly explained and displayed to the player.

5.3.3 Computerized Players. The following requirements apply to use of computerized players:

- a) The software may employ the use of Artificial Intelligence (AI) in order to fill up multi-

player tables.

- b) The use of AI software must be clearly explained in the help menus.
- c) The use of AI software may only be used upon player request and may not be used by the software to automatically fill empty table seats.
- d) All AI players must be clearly marked at the tables so that players are aware of which players are not human.
- e) Any artificial intelligence used to fill in game tables must not have a tactical advantage against the average human player. (i.e. They may not communicate with the server to see what other cards the players are holding in order to determine the next action taken).
- f) Steps to report suspected player-bot usage from a player must be clearly explained in the help menus.

5.4 Game Play

5.4.1 General Statement. The following rules pertain to the game play:

- a) Hotlinks used to supply game information such as game rules and paytables, must be checked daily.
- b) An invitation to play a particular game must only be extended if the Gaming Platform determines that the encrypted communications channel to the end player device is adequate for that game, and the end player device has sufficient capabilities to play the game (e.g. check the version number of the web browser and/or the version number of the game client).
 - i) If the software is designed so that players may invite each other to play a particular game, or sit at a particular table, the software must prohibit any one player from sending an invitation to more players than the game allows, or seats that are open at the current table.
 - ii) Invitations to play must require a person to either accept or discard the invitation. If no action has been taken by the recipient after five minutes, decline must be automatically selected by the software.
 - iii) Once a player declines an invitation, the player that sent the invite shall be notified and subsequently be permitted to invite another player.

- iv) The software shall prohibit the player from choosing the wording of an invitation. The player may choose from a variety of options, which will generate a standardized invitation (i.e. “Player1 has sent you an invitation to play Texas Hold’em at table number 1111, which has a minimum bet of 20 credits and a no-limit maximum bet.”, or “Player1 has sent you an invitation to play Texas Hold’em at a new table. You will be able to discuss the table options in the pre-game lobby”, etc...).
 - c) For multi-player games where the result is affected by the time to respond to a game event, the Gaming Platform must only offer the game after informing the player of any handicap associated with the communication channel. Games that are inherently unfair will not be approved.
 - i) All multiplayer games must be equipped with a latency meter which allows the player to readily determine the strength of the end user’s connection to the server
 - ii) This can be displayed via any appropriate method, such as displaying the ping time in milliseconds, the display of “high”, “medium”, and “low” in regards to latency, the use of red, yellow, and green for speed of connection, etc...
 - d) If a cookie is required to be accepted for game play, an invitation to play may only be extended if the Gaming Platform determines that the end play device can accept them. All cookies used shall contain no malicious code.
 - e) The client software must not operate if sufficient resources are not available to it. The player must be informed of the minimum Gaming Platform specifications required to correctly run the client software. Visual instructions must accompany any sound used to provide instructions on how to play games.
 - f) If the Gaming Platform extends an invitation to play a particular game, it must accept all legitimate wagers for that game.
 - g) There must exist a Game Selection Menu where the full amount of the player’s session balance is displayed in currency or credits. If a player’s session balance is different from the total funds held by the provider on the player’s behalf it must be unambiguous to the player that they are different. On a player’s session balance becoming zero or less than an amount necessary to place a bet or on the player exiting the game being played the player’s total funds are to be displayed.
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- h) The methodology employed by a player to select and play a particular game must be unambiguous.
- i) The Gaming Platform must clearly inform the patron player of all games available at that time.
- j) The player must at all times be made aware of which game has been selected for play or is being played.
- k) The player must not be forced to play a game just by selecting that game.
- l) It must not be possible to start a new game before all relevant meters have been updated on the Gaming Platform and all other relevant connections and session balance, or if applicable, player's total funds balance, has been updated.
- m) A gaming device shall only initiate game play:
 - i) After credits have been registered, and
 - ii) After the player has nominated the number of credits to bet on that game, and
 - iii) After the player presses a "play" button (or similar input).
- n) If an auto play mode is incorporated, it shall be possible to turn this mode off at any time during game play.

5.4.2 Incomplete Games. The following requirements apply to incomplete games:

- a) A game is incomplete when the game outcome remains unresolved or the outcome cannot be properly seen by the player. Incomplete games may result from:
 - i) Loss of communications between the Gaming Platform and the end player device;
 - ii) A Gaming Platform restart;
 - iii) An end player device restart;
 - iv) A game disable by the Gaming Platform during play; or
 - v) Abnormal termination of the gambling application on the end player device.
- b) The Gaming Platform must provide a mechanism for a player to complete an incomplete game.
- c) Upon reconnection by the player, the Gaming Platform must present the player the incomplete game for completion:

- i) Where no player input is required to complete the game, the game must display the final outcome as determined by the RNG and game rules, and the player's account must be updated accordingly;
 - ii) For single-player games, where player input is required to complete the game, the game must return the player to the game state immediately prior to the interruption and allow the player to complete the game; and
 - iii) For multi-player games, the game must display the final outcome as determined according to the operator's rules for multi-player games, and the player's account must be updated accordingly.
- d) Bets associated with a partially complete game that can be continued must be held by the Gaming Platform until the game completes. Player accounts must reflect any funds held in incomplete games.
- e) The operator's Terms and Conditions must specify that bets placed but remaining undecided in incomplete games will become void after a specified time, and will be forfeited.

CHAPTER 6

6.0 *Jackpot (Progressive) Requirements*

6.1 Introduction

6.1.1 General Statement. A Jackpot (Progressive) is an increasing prize, based on a function of credits that are bet. This includes prizes that are awarded based on criteria other than obtaining winning outcomes in the game, such as ‘Mystery Jackpots.’ However, this does not include prizes that result from bonus features which are part of the game theme, which offer prizes that increase as the game is played and, as well, is not configurable.

6.2 Jackpot Design and Operation

6.2.1 Jackpot Fairness. In order to have a jackpot that is fair to players the following principles must apply:

- a) All players that play jackpot games must be made aware of actions which would make them eligible to win the jackpot.
- b) Where jackpot contributions are part of the %RTP calculation, the contributions must not be assimilated into revenue. If a cap is established on any jackpot all additional contributions once that cap is reached are to be credited to a Diversion Pool. The minimum return to player must be achieved regardless of the number of betting units calculated.
- c) The rules of the game must incorporate how the jackpot is funded and determined.
- d) If a minimum bet amount exists in order for a player to win a linked jackpot, then the base game (excluding the jackpot) must meet the minimum player return.
- e) The current jackpot amount should be displayed on all end player devices participating in the Jackpot. This display should be updated on all participating end player devices at least every 30 seconds.

NOTE: It is accepted that, depending upon the medium, communication delays are variable and beyond the knowledge or control of the operator. Server-to-client delays will vary from player to player and from message to message.

6.2.2 Reserved.

6.2.3 Jackpot Controller. The jackpot controller is deemed part of the Gaming Platform even if it is one or more physically separate devices.

- a) Where a “Master Controller” employs “Slave Controllers” to control a Jackpot the following requirements apply:
 - i) All Slave Controllers must be time synchronized with the Master Controller,
 - ii) The Master Controller must be time synchronized with the Gaming Platform, and
 - iii) Jackpot win events must be time-stamped and the Jackpot Controller must ensure that hits registered within a minimum time increment are considered as simultaneous wins. Prize payout for simultaneous wins is to be made in accordance with the Rules of the game.
- b) The minimum time window (Jackpot Reset Period) is not less than the longest time taken to:
 - i) Register that a jackpot has been won,
 - ii) Announce the win on the displays of all participating end player devices with an active session, and
 - iii) Reset the progressive meters.
- c) If supporting a jackpot that is determined by increments of individual player’s wagers, the processing of receipt of increments from all end player devices, whether attached to Master or Slave controllers, must be fair.

6.2.4 Jackpot Win Notification. The following requirements must be met when there is a jackpot win:

- a) A winning player must be notified of a jackpot win by the end of the game in play;
- b) The notification of the jackpot being won must be provided to all end player devices participating in the jackpot at the time of the jackpot win;
- c) The jackpot amount must be displayed on all end player devices participating in the

jackpot at the time of the jackpot win; and

- d) The jackpot win notification should also display the value to which the jackpot is being reset.

6.2.5 Multiple (Simultaneous) Jackpot Winners. The operator must address the possibility of a jackpot being won (or appearing to be won) by one or more players at approximately the same time. The rules of the game must include resolution of this possibility.

6.2.6 Jackpot Parameter Changes. The following requirements apply to configuring jackpots:

- a) Once a Jackpot has commenced, parameter changes must not take effect immediately - rather they should be saved to apply after the current Jackpot is won. These are ‘pending’ parameters.
- b) A Mystery Jackpot which uses a hidden jackpot amount to determine the jackpot win must not change the hidden jackpot amount when the parameters are changed if the jackpot is active (i.e. had any jackpot contributions added to it).
- c) The Gaming Platform must provide a means of displaying current and pending jackpot parameters.
- d) The Gaming Platform must record the values of all jackpot meters, as well as all of the “Current” and “Pending” jackpot parameters.

6.2.8 Jackpot Shutdown. There are instances where a jackpot should be shut down. The following requirements shall apply in the event of a jackpot shutdown:

- a) Clear indication must be given to players that the jackpot is not operating (e.g. by displaying “Jackpot Closed” on end player devices).
- b) It must not be possible for the jackpot to be won while in the shutdown state.
- c) If the jackpot operates in conjunction with another game (e.g. base game) and the player return requirement is only met when jackpot contributions are included the other game may only be offered when the jackpot is available.
- d) Activation of the jackpot from the shutdown state must return the jackpot with the identical parameters including jackpot value, and hidden win amount for mystery jackpots, as before the shutdown.

6.2.9 Jackpot Recovery. To enable recovery of the current value of the progressive jackpot amount(s) in the case of a Gaming Platform or jackpot controller failure, either:

- a) The current value of the progressive amount must be stored in at least two physically separate devices, or
- b) The current value of the progressive amount must be able to be accurately calculated from other available metering information, which is not stored in the same Gaming Platform as the progressive amount.

In either case, all eligible jackpot winners must be paid as soon as the value is recovered.

6.2.10 Jackpot Contributions. The rules of the game must clearly specify how the contributions to the jackpot pool are made (based on turnover, net balance of each operator contributing to a multi-operator pool, etc).

6.2.11 Multi-Operator Jackpots. Multi-operator Jackpots will be considered on a case-by-case basis.

6.2.12 Jackpot Accounting. If the calculation of gross revenue for taxation purposes allows for jackpot contributions to be totally deductible (as opposed to deducting jackpot prizes when paid), the Gaming Platform must provide adequate reconciliation to ensure that all jackpot increments deducted:

- a) Have been paid to players as prizes; or
- b) Are displayed as part of prizes; or
- c) Are held in accountable reserves (which can be demonstrated) to be paid to players in the future, (i.e. as part of future prizes).

CHAPTER 7

7.0 *Information Systems Security (ISS) Requirements*

7.1 **Reserved**

7.2 **Administrative Controls**

7.2.1 *Change Control Procedures.*

- a) Program change control procedures must be adequate to ensure that only properly approved and tested versions of programs are implemented on the production Gaming Platform. Production change controls must include:
 - i. An appropriate software version control or mechanism for all software components;
 - ii. Details of the reason for the change;
 - iii. Details of the person making the change; and
 - iv. Complete backups of previous versions of software.

7.2.2 *Authentication.*

- a) All people (e.g. players, computer operators, maintenance service providers, jurisdiction officers and representatives) and computer systems (e.g. jackpot controllers, financial gateway systems, certification authority systems) that connect to the Gaming Platform must be authenticated except as provided in item (b) below.
- b) Players who connect to the Gaming Platform for purposes other than gambling do not need to be authenticated unless sensitive account information (i.e. monetary transactions, personal information etc...) is being accessed.
- c) The Gaming Platform must authenticate itself to all people and computer systems that establish a connection.
- d) Authentication of people, computer systems controlled by the operator and third party

Gaming Platforms must be based on a certification authentication method recognized by the Jurisdiction as being currently secure.

- e) Where a player has forgotten their password/PIN, the Gaming Platform must provide a secure process for the re-authentication of the player and the retrieval and/or resetting of the password/PIN.

7.2.3 Software Development, Testing, Maintenance and Service.

- a) Cross-platform software must have identical code for each version, with the exception of operating system dependent functionality.

7.2.4 Code Security.

- a) Closed Source Software. Where appropriate code should be protected as much as possible from the player.
- b) Open Source Software. If the software is being submitted as an open source project:
 - i. The developers of the software must obtain a valid open source programming license in order to be classified as an open source submission.
 - ii. A valid procedure must be implemented, which does not violate the open source software license obtained, in order to prevent individuals from publicly publishing their own code modifications that alter the security and integrity of the software and Gaming Platform.
 - iii. The Gaming Platform must be able to reasonably detect any end user made code modifications, and prevent the software from running if any modifications can alter the integrity of the game and/or Gaming Platform.
- c) Customizable Aspects Through Code Changes: If the client software allows for user customization (e.g. customizable decks of cards), then the following requirements must be met:
 - i. The game client may allow for user customization (i.e. interface skinning, customized card decks, etc...). However, should the method of customization be implemented through code modifications, the code must only consist of markup languages.
 - ii. No programming languages may be used for this purpose, which are able to

perform Gaming Platform level commands.

- d) Any publicly installable theme packages must be hosted and monitored on the official website for the game, and all themes uploaded must be verified to ensure they contain no potential exploits or malware.

7.3 Technical Controls

7.3.1 Proxy Servers.

- a) The Gaming Platform must be capable of operating through multiple proxy servers. Correct operation of games must not depend on a refresh request from the end player device reaching the Gaming Platform.

7.3.2 Self-Monitoring.

- a) The Gaming Platform must implement the self-monitoring of critical components (e.g. central hosts, network devices, firewalls, links to third parties, etc.).
- b) A critical component which fails self-monitoring tests must be taken out of service immediately. The component must not be returned to service until there is reasonable evidence that the fault has been rectified.

7.3.3 Protection from Attacks.

- a) All reasonable precautions must be taken to protect the Gaming Platform against attacks based upon the replay of authentic or non-authentic messages (for example, Distributed Denial of Service Attack).
- b) The software must be able to reasonably detect and/or prevent a man-in-the-middle style attack without invading the end user's privacy.
- c) If a man-in-the-middle attack has been suspected, all communications between the suspected client and server must be terminated with a message displayed to the end user as to why communications were terminated.
- d) Upon termination of client-server communications, the appropriate steps to determine if the end user was performing a man-in-the-middle attack. If it was determined that a man-in-the-middle attack was attempted, the appropriate actions in regards to cheating must be

taken.

- e) All reasonable precautions must be taken to ensure that no data kept on the Gaming Platform or transferred by it can be infected with a virus program, Trojan Horse, worm, or other malware.

7.3.4 Network Security Management.

- a) Networks shall be adequately managed and controlled, in order to be protected from threats, and to maintain security for the systems and applications using the network, including information in transit.
- b) Security features, service levels, and management requirements of all network services shall be identified and included in any network services agreement, whether these services are provided in-house or outsourced.

7.3.5 Network Access Controls.

- a) An access control policy shall be established, documented, and reviewed based on business and security requirements for access.
- b) A formal user registration and de-registration procedure must be in place for granting and revoking access to all information systems and services.
- c) The allocation of user privileges shall be restricted and controlled based on business requirements.
- d) Management shall review users' access rights at regular intervals using a formal process.
- e) Users shall only be provided with access to the services that they have been specifically authorized to use.
- f) Passwords must be controlled through a formal management process.
- g) The selection of passwords must follow good security practices.
- h) Unattended equipment shall have appropriate protection and automatically log the user out after a pre-determined interval.
- i) Appropriate authentication methods shall be used to control access by remote users.
- j) Automatic equipment identification shall be considered as a means to authenticate connections from specific locations and equipment.

- k) Physical and logical access to diagnostic and configuration ports shall be controlled.
- l) Groups of information services, users, and information systems shall be segregated on networks.
- m) For shared networks, especially those extending across the organization's boundaries, the capability of users to connect to the network shall be restricted, in line with the access control policy and requirements of the business applications.
- n) Routing controls shall be implemented for networks to ensure that computer connections and information flows do not breach the access control policy of the business applications.

7.3.6 Operating System Access Controls.

- a) Access to operating systems shall be controlled by a secure log-on procedure.
- b) All users shall have a unique identifier (user ID) for their personal use only, and a suitable authentication technique shall be chosen to substantiate the claimed identity of a user.
- c) Systems for managing passwords shall be interactive and shall ensure quality passwords.
- d) The use of utility programs that might be capable of overriding system and application controls shall be restricted and tightly controlled.
- e) Inactive sessions shall shut down after a 30 minutes of inactivity.
- f) Restrictions on connection times shall be used to provide additional security for high-risk applications.
- g) Access to information and application system functions by users and support personnel shall be restricted in accordance with the defined access control policy.
- h) Sensitive systems shall have a dedicated (isolated) computing environment.
- i) A formal policy shall be in place, and appropriate security measures shall be adopted to protect against the risks of using mobile computing and communication facilities.
- j) A policy, operational plans and procedures shall be developed and implemented for telecommuting activities.

7.3.7 Cryptographic Controls. A policy on the use of cryptographic controls for protection of information shall be developed and implemented.

- a) Where sensitive data is being passed over communication lines, such data must be encrypted. Examples of data that may require encryption are PINs or passwords, account numbers (including card numbers) and details, encryption keys, player identity details, funds transfers to and from customer accounts, changes to account details (e.g.: change of address, change of credit card, change of name, etc.), and game play (i.e.: games played, amounts bet, amounts won, jackpots won etc.).
- b) Data that is not required to be hidden but must be authenticated must use some form of message authentication technique;
- c) Sensitive data must be encrypted on an end-to-end basis (i.e. the data must never appear on a LAN or WAN in an un-encrypted form). This includes sensitive data transmitted between computer Gaming Platforms within an operator's premises;
- d) Sensitive data transmitted between Gaming Platforms on a switched network within a single secure data center need not be encrypted;
- e) Sensitive data transmitted between Gaming Platforms that are located within separate secure data centers need not be encrypted if the communications path is physically secure and cannot be access by unauthorized people;
- f) All communications between operator terminals and the Gaming Platform must be strongly authenticated and strongly encrypted during transmission outside their respective secure data centers; and
- g) Authentication must be available via a Secure Socket Link (SSL) and a security certificate from an approved organization.
- h) Encryption algorithms are to be demonstrably secure against cryptanalytic attacks;
- i) Operators must have approved procedures for following up reports of weaknesses in encryption algorithms used in any part of the Gaming Platform (including, but not limited to, RNGs, firewalls, authentication systems and operating Gaming Platform). Changes to encryption algorithms to correct weaknesses must be implemented as soon as practical. If no such changes are available, the algorithm must be replaced.

7.3.8 Cryptographic Key Management.

- a) The minimum width (size) for encryption keys is 112 bits for symmetric algorithms and 1024 bits for public keys.

- b) There must be a secure method implemented for changing the current encryption keyset. It is not acceptable to only use the current key set to “encrypt” the next set. An example of an acceptable method of exchanging keys is the use of public key encryption techniques to transfer new key sets.
- c) There must be a secure method in place for the storage of any encryption keys. Encryption keys must not be stored without being encrypted themselves through a different encryption method and/or by using a different encryption key.

7.3.9 Malicious and Mobile Code.

- a) Detection, prevention, and recovery controls to protect against malicious code and appropriate user awareness procedures shall be implemented.
- b) Where the use of mobile code is authorized, the configuration shall ensure that the authorized mobile code operates according to a clearly defined security policy, and unauthorized mobile code shall be prevented from executing.

7.3.10 Monitoring.

- a) Audit logs recording user activities, exceptions, and information security events shall be produced and kept for an agreed period to assist in future investigations and access control monitoring.
- b) Any modification, attempted modification, read access or other change or access to any Gaming Platform record, audit or log must be noticeable by an approved Gaming Platform via version control or file time stamping. It must be possible to see who has viewed or altered a log and when.
- c) Procedures for monitoring use of information processing facilities shall be established and the results of the monitoring activities reviewed quarterly or as provided by the jurisdiction.
- d) Logging facilities and log information shall be protected against tampering and unauthorized access.
- e) System Administrator and System Operator activities shall be logged.
- f) Faults shall be logged, analyzed, and appropriate action taken.
- g) The clocks of all relevant information processing systems within an organization or

security domain shall be synchronized with an agreed accurate time source.

7.3.11 Communications Security Management. This section refers to communications between the host Gaming Platform and an end player device, but it also applies to communications between other components or equipment of the Gaming Platform.

- a) Message authentication must be used with critical message types, such as jackpot wins and password/PIN transmissions, in order to verify the correct receipt of the message by the end player device, host or related equipment. A protocol that doesn't correct errors or re-send erroneous packets (e.g. UDP) may be used as long as no critical game data or information is sent in this manner. For example, if UDP is being used to stream video or sound then it would not be acceptable to have the game instructions or payable in this format only.
- b) The game server must be able to validate all of the information received from the client to ensure no additional data (such as a worm) has been sent.
- c) If it has been detected that additional data (such as a worm) has attached itself to the received data, the game server must not allow the extraneous byte code to pass through to the Gaming Platform.
- d) All protocols must use communication techniques which have proper error detection and/or recovery mechanisms and meet the following rules:
 - i. The high level protocol must employ techniques (e.g. end to end acknowledgment) such that it will not lose messages – even when one end or the other restarts;
 - ii. These techniques must not cause either the Gaming Platform or any end player device to completely halt all processes while waiting for this acknowledgement.
- e) The higher level protocol must employ techniques (e.g. transmission numbers) such that repeated messages are identified and discarded – even when one end or the other restarts;
- f) These requirements do not apply to unsecured messages such as broadcast messages;
- g) All functions of the protocol must be clearly specified in its documentation;
- h) The following rules apply to the timestamps in a high level protocol:
 - i. It must include a provision for the transmitting system (i.e. Gaming Platform or end player device) to insert a local timestamp in every message it sends. This timestamp will assist in claims of equipment malfunction involving run away

- hardware or software; and
- ii. It must include a provision for the transmitting system (i.e. Gaming Platform or end player device) to insert a local timestamp taken at the time the last valid high level message was received.
- i) The following requirements apply to High Level Interface with Lower Level Protocols:
- i. There must be no restrictions placed on characters that may be included in messages passed to or from the higher levels to the lower levels;
 - ii. The interfaces between the high layer protocols and the low layer protocols must cater for messages of variable length including those longer than the standard buffer size of the lowest level;
 - iii. A method of flow control to prevent loss of vital messages must be implemented;
 - iv. The Gaming Platform shall detect the maximum transfer speed between it and the player's environment and notify the player if the speed detected falls below the minimum requirement set by the Regulator responsible for the player's Jurisdiction; and
 - v. This information shall be displayed to the player via a latency meter which fits the requirements listed within this document.

7.3.12 Firewalls. The following requirements apply to firewalls:

- a) All connections to Gaming Platform hosts in the secure data center must pass through at least one approved application-level firewall. This includes connections to and from any non-Gaming Platform hosts (e.g. MIS computer Gaming Platforms) used by the operator. The term "connections" is used in its broadest sense, and includes UDP and TCP data transfers;
- b) The choice of firewall will be affected by the low-level protocol used by the application. (e.g. some firewalls are not able to make intelligent decisions about UDP streams.) Reducing the effectiveness of the application level firewall to a packet filter will not be permitted simply due to a poor choice of firewall / low level protocol combination;
- c) A device in the same broadcast domain as the Gaming Platform hosts must not have a

facility that allows an alternate network path to be established that bypasses the firewall.

Examples of prohibited facilities are:

- An operator PC equipped with a phone modem; and
 - An operator PC with a connection to the Gaming Platform VLAN and a connection to the corporate VLAN.
- d) The firewall must be a separate hardware device with the following characteristics:
- i. Only firewall-related applications may reside on the firewall; and
 - ii. Only a limited number accounts may be present on the firewall (e.g. Gaming Platform administrators only).
- e) All data packets addressed to the firewall must be rejected if they arrive on interfaces to networks which are outside the baseline envelope. This is to restrict access to the firewall to authorized workstations inside the baseline envelope;
- f) The firewall must reject all connections except those that have been specifically approved by the jurisdiction;
- g) The firewall must maintain an audit log of all changes to parameters that affect what connections are permitted through the firewall;
- h) The firewall must maintain an audit log of all successful and unsuccessful connection attempts through itself;
- i) The firewall must disable all communications if the audit log becomes full;
- j) The firewall must reject all messages received on an interface if the message purports to be on a device attached to another interface;
- k) Operators must have approved procedures for following reports of security incidents and for ensuring that firewalls are kept up to date with respect to advisory recommendations released after such incidents; and
- l) Networks on the secure side of the firewall should use RFC1918 private network numbers. These numbers must be translated into public network numbers for transmission over the Internet.

7.3.13 Web Application Security. The following requirements apply to the security of the application used in the end player device:

- a) The Gaming Platform must be able to detect the version of the web browser or client software, being used by the player at the time the player logs on.
- b) If the version of the web browser or client software being used by the player does not have the capability to run the application (e.g. the game requires Flash Player 10 but the browser only has Flash Player 8), the Gaming Platform must not allow the application to be executed until the client software has been updated, and must provide a link to download any required upgrades.

Glossary

Term or Abbreviation Description

Interactive Gaming System (IGS) - The hardware, software, firmware, communications technology and other equipment which allows a player to remotely bet or wager through the Internet or a similarly distributed networking environment, and the corresponding equipment related to game outcome determination, the display of the game and game outcomes, and other similar information necessary to facilitate play of the game. The term does not include computer equipment or communications technology used by a player to access the interactive gaming system.

Gaming Platform - The interactive gaming system hardware and software which drives the features common to all games offered, and which forms the primary interface to the gaming system for both the player and the operator. The gaming platform provides the player with the means to register an account, log in to / out of their account, modify their account information, deposit and withdraw funds to / from their account, request account activity statements / reports, and close their account. In addition, any web pages displayed to the player that relate to gaming offered on the IGS, but are not an actual game screen, are considered to be part of the gaming platform. The gaming platform provides the operator with the means to review player accounts, enable / disable games, generate various gaming / financial transaction and account reports, input game outcomes for sports betting events, enable / disable player accounts, and set any configurable parameters.

Background Cycling / Activity - If the software-based RNG is cycling in the background, it means that there is a constant string of random numbers being generated by the RNG, even if they are not actually required by the game at that time. Without background cycling / activity, one could predict the result of the next iteration of the function used to produce the random numbers if the current values and the algorithm were known.

Percentage Return to Player (%RTP) - The expected percentage of wagers that a specific game will return to the player in the long run. The %RTP can be calculated via either a theoretical or simulated approach. The method used for calculation depends on the game type.

Multi-stage Game - A game having one or more intermediate steps that require player input in order to proceed. Poker and Blackjack are two examples of multi-stage games.

Mapping - The process by which a scaled number is given a symbol or value that is usable and applicable to the current game (e.g.: the scaled number 51 might be mapped to an ACE OF SPADES).

Scaling - Raw output from an RNG will normally have a range far in excess of that required for its intended use (e.g.: 32-bit RNG's have over two billion possible outcomes, but (for example) we have only to determine which of 52 cards to draw). Scaling is required to divide the raw output into smaller, and usable numbers. These 'scaled' numbers can then be mapped to particular card numbers, record numbers, symbols, etc... Consequently, raw output from an RNG will sometimes have a range far smaller than that required for its intended use (e.g.: $0 < \text{raw output} < 1$). In these cases, scaling is required to expand the RAW output into larger usable numbers.

Metamorphic Game - A metamorphic game is where the rules of the game provide for the game to have 'memory' of prescribed previous events, such that these events build up over time, eventually resulting in some change in the game. For example, the game could be designed to allow the player to gather special coins or token throughout regular game play. Once enough coins / tokens are accumulated, the game enters into a special feature. Upon exiting this feature, the coins / tokens are reset to zero, allowing the player start accumulating them over again.

Random Number Generator (RNG) - The IGS hardware and / or software which determines random outcomes for use by all of the games hosted / offered on the gaming platform.

Baseline - An administrative method a taking a snapshot of an evolving system (and in some cases defining what portions of the system can be changed without approval).

Broadcast domain - The set of computer systems that are able to communicate with one another using network level broadcast packets. An example of a broadcast domain is an IP subnet.

Contributions - The financial method by which jackpot pools are funded.

Critical Component - Any sub-system whose failure or compromise can lead to loss of player entitlements, government revenue or unauthorized access to data used for generating reports for the jurisdiction.

Digital Certificate - A set of data which can be used to verify the identity of an entity by reference to a trusted third party (the Certification Authority). Digital certificates are often used to authenticate messages for non-repudiation purposes. One of the attributes of a digital certificate is that it cannot be modified without compromising its internal consistency. X.509 certificates are an example of a digital certificate.

Domain Name System - The globally distributed Internet database which (amongst other things) maps machine names to IP numbers and vice-versa.

Effective bandwidth - The amount of data that actually can be transferred across a network per unit of time. The effective bandwidth through the Internet is usually considerably lower than the bandwidth of any of the constituent links.

End Player Device - The device that converts communications from the Gaming Platform into a human interpretable form, and converts human decisions into communication format understood by the Gaming Platform. Examples of End Player Devices include personal computers and telephones.

Hotlink - A word or graphic on a web page which, if clicked, causes a different information page to be displayed.

ICMP - Internet Control Message Protocol. Part of the TCP/IP communications protocol which is used to measure and control devices at the IP level. ICMP echo request and ICMP echo reply are commonly and collectively known as "ping" or "trace route".

Increment Rate - The portion of the jackpot contributions that are incrementing the jackpot (as compared to funding the startup value).

Link utilization - The percentage time that a communications link is engaged in transmitting data.

Mystery Linked Jackpot - A type of jackpot where a randomly selected trigger point is chosen between a jackpot start-up amount, and a maximum win amount. A win is triggered when contributions to the jackpot increment the startup value to the trigger amount.

Pool - An accumulated reservoir of jackpot monetary contributions.

Progressive Linked Jackpot - A type of jackpot where the Gaming Platform triggers the jackpot prize (the prize being a pool of contributions from a group of machines participating in the jackpot).

Protocol - Used to refer to the hardware interface, line discipline and message formats of the communications.

Sensitive data - Data which, if obtained by a third party, may be used to affect game outcome/s or player/s accounts.

Signature Check - A security mechanism a CMCS uses to verify SW in peripheral devices or end player devices.

Soft gambling product - A gambling product that meets the published set of criteria for "soft" gambling products or receives special approval under the National Regulatory Model.

Startup value - The initial jackpot value (does not include values from overflow meters).

Time Based Jackpots - A type of jackpot where a randomly selected trigger time is chosen between a jackpot run start time and the jackpot run end time.

Timestamp - A record of the current value of the Gaming Platform date and time which is added to a message at the time the message is created.

Trojan Horse - A program or module that purports to perform a particular function but which secretly performs a different function (which may or may not include the purported function). Trojan Horse programs are widespread throughout the Internet.

Version Control - The method by which an evolving approved Gaming Platform is verified to be operating in an approved state.

Appendix A: Submission Requirements

A.1 Introduction

A.1.1 General Statement. This chapter shall govern the types of information that are, or may be required to be submitted by the submitting party in order to have elements or components of an Interactive Gaming System tested to this Standard. Where the information has not been submitted or is not otherwise in the possession of the testing laboratory, the submitting party shall be asked to supply additional information. Failure to supply the information can result in denial in whole or in part of the submission and/or lead to testing delays.

A.1.2 Previous Submission. Where the testing laboratory has been previously supplied with the information on a prior submission, duplicate documentation is not required, provided that the previous information is referred to by the submitting party, and those documents are easily located at the testing laboratory. Every effort shall be made to reduce the redundancy of submission information.

A.2 Prototype (Full Submission) Submissions

A.2.1 General Statement. A Prototype (full submission) submission is a first time submission of a particular piece of hardware or software that has not previously been reviewed by the testing laboratory. For Modifications of previous submissions, including required changes to previously submitted Prototype (full submission) certification, whether certified or pending certification, see ‘Submissions of Modifications (partial submissions) to a Previously Certified Item,’ Section A.3.

NOTE: *Due to abnormal component complexity and/or excessive cost it is sometimes necessary for on-site testing of a Gaming Platform at the manufacturer’s facility. The requirement for on-site testing will be assessed on a case-by-case basis.*

A.2.2 Submission Letter Requirements. Each submission shall include a request letter, on company letterhead, dated within one (1) week of the date the submission is received by the testing laboratory. The letter should include the following:

- a) The jurisdiction(s) for which you are requesting certification;
- b) The items requested for certification. In the case of software, the submitting party shall include ID numbers and revision levels, if applicable. In the case of proprietary hardware, the submitting party shall indicate the manufacturer, model, and part and revision numbers of the associated components of hardware; and
- c) A contact person who will serve as the main point of contact for engineering questions raised during evaluation of the submission. This may be either the person who signed the letter or another specified contact.

A.2.3 Gaming Platform Submission Requirements. The “Gaming Platform” includes the Gaming Platform components which provide features common to all of the games, including game configuration, logging, communications, and reporting functions. The gaming platform provides the operator with the means to review player accounts, enable / disable games, generate various gaming / financial transaction and account reports, input game outcomes for sports betting events, enable / disable player accounts, and set any configurable parameter. The following sections outline the submission requirements for a gaming platform.

I. Source Code The following requirements apply to any gaming platform component source code requested by the testing laboratory for evaluation:

- a) Any gaming platform component source code submitted to the testing laboratory shall be reviewed in a secure, controlled and supervised manner which is agreeable to the testing laboratory, the regulator and the software vendor;
- b) Any gaming platform component source code submitted to the testing laboratory shall contain the following information (at a minimum):
 - i. File / module / function name(s);
 - ii. Brief description of the file / module / function purpose(s);
- c) Any gaming platform component source code submitted to the testing laboratory shall be commented in an informative and useful manner; and
- d) The method used to verify the integrity of the software operating on the production Gaming Platform should be described. If a software verification algorithm is used, provide a description of the algorithm, the theoretical basis of the algorithm, the results of any analyses or tests to demonstrate that the algorithm is suitable for the

intended application, rules for selection of algorithm coefficients or "seeds", and the means of setting the algorithm coefficients or "seeds".

II. Documentation The following documentation must be submitted for the gaming platform evaluation:

- a) Details of the physical location of each component of the Gaming Platform;
- b) A list of all games hosted / offered on the gaming platform;
- c) An all-inclusive functional description of the gaming platform (including the gaming website home page and all gaming website peripheral pages), to include a general overview of the Gaming Platform from a component level, software and hardware setup and integration, and Gaming Platform block diagrams and flow charts for the communication program;
- d) Detailed functional descriptions of the following technical functionality available on the gaming platform:
 - i. Logging Capability,
 - ii. Communications Capability, including supported communication protocols,
 - iii. Operator Interface to Player Accounting,
 - iv. Gaming Platform Accounting and Financial Reporting Capabilities,
 - v. Gaming Platform Payment Systems & Financial Institution Interfacing, and
 - vi. Player Location & Identity Verification Software.
- e) Details of each class of account required to operate the Gaming Platform in a production environment (e.g. System Administrator, Operator, Hotline, Network support), including the privileges required to perform the duties associated with that account;
- f) Copies of all standard reports produced by the Gaming Platform and a description of how these are generated, including details of any reconciliation reports; and
- g) If not included in the user manuals, concise instructions for the configuration of all applicable parameters of bonus activity.

III. Test Environment – Supervised Build and Install Before commencing testing, the testing laboratory will supervise the build / compilation of the gaming platform source code into software. In this context, “supervise” means that a consultant from the testing

laboratory must be present, in person or via a remote connection, while the gaming platform source code is being built / compiled.

The control-version(s) of the gaming platform, created as a result of the supervised build / compilation, must then be installed onto a suitable test environment. The testing laboratory and the software supplier must ensure that the software which is installed is the same version as was built / compiled under the testing laboratory's supervision. Particular attention will be given to any configuration performed to the test environment to accommodate the software that has been installed. The testing laboratory must obtain a copy of any necessary configuration files.

The resulting test system must be similar to that of the production Gaming Platform, and identical in respect of all critical functionality in regard to the gaming platform, which will enable meaningful testing of the software prior to it being loaded onto the live Gaming Platform.

Where a Gaming Platform requires the use of defined user roles, or accounts with associated passwords or PIN numbers, a default list of all users and passwords or PIN numbers must be submitted including a method to access the database.

A.2.4 Game Submission Requirements “Game” refers to gaming platform software which is specific to each individual game that is hosted / offered on the gaming platform. Each game is to be treated as a separate and distinct entity. Any information and materials required to be submitted with respect to the games must be submitted for each individual game hosted / offered on the gaming platform. The following sections outline the submission requirements for games.

- I. Source Code** The following requirements apply to game source code submitted to the testing laboratory:
- a) Any game source code submitted to the testing laboratory shall be reviewed in a secure, controlled and supervised manner which is agreeable to the testing laboratory, the regulator and the software vendor.
 - b) Any game source code submitted to the testing laboratory shall contain the following information (at a minimum):
 - i. File / module / function name(s), and
 - ii. Brief description of file / module / function purpose(s).
-

- c) Any game source code submitted to the testing laboratory shall be commented in an informative and useful manner; and
- d) Where the game outcome determination or game payouts are performed by scripting functions (e.g. .sql or .php scripts) the source code of the scripts and access the related databases must be provided.

II. Documentation The following documentation must be submitted for each individual game hosted / offered on the gaming platform:

- a) Game name;
- b) Game version or ID number(s);
- c) Paytable version number(s);
- d) Detailed game rules, including all options and bonus features;
- e) Detailed breakdown of all paytables, payouts and mapped symbols present in the game;
- f) Where game outcomes are determined using a Random Number Generator (RNG), details of all RNG calls from the game and the locations of all RNG calls in the submitted source code;
- g) A formal mathematical treatise of the derivation of the theoretical Percentage Return to Player (%RTP) of the game;
- h) Details of all jackpots associated with the game;
- i) Details of the game information recorded on the gaming platform backend;
- j) Details of how end player devices are polled to implement timeouts and player protection features, if applicable; and
- k) Where the evaluation involves event-based wagering, the following submission materials will be required:
 - i. Details of all event-based wagering types to be provided including descriptions of the events and bet types.
 - ii. Copies of all proposed rules, including all prize tables or other such parameters, for each event wagering type.
 - iii. A description of the commission structure.
 - iv. A description of how the operator obtains and publishes reliable official results for wagering events.

- v. A description of links to any external computer systems participating in the event wagering.
- vi. A description of how wagers are settled.
- vii. A description of the in-running betting process, if applicable, including selection of events, information offered to players in advance, dedicated technology, etc.

III. Emulation Capability The purpose of emulation capability is to facilitate the testing process.

Emulation capability is a mode of game operation which is alternate to the standard / live version of the game (i.e. to be activated and operated in the test environment only) whereby the game outcomes can be artificially introduced into the game by the testing laboratory, processed by the same game logic as the standard / live version of the game and then displayed to the player for testing purposes.

Unless a game makes use of only game outcomes which are commonplace throughout the course of standard game play, the testing laboratory must be provided with emulation capability for game testing purposes.

IV. Test Environment – Supervised Build and Install Before commencing testing, the testing laboratory will supervise the build / compilation of the game source code into software. In this context, “supervise” means that a consultant from the testing laboratory must be present, in person, or via a remote connection while the game source code is being built / compiled.

The control-version(s) of the game, created as a result of the supervised build / compilation, must then be installed onto a suitable test environment. The testing laboratory and the software supplier must ensure that the software which is installed is the same version as was built / compiled under the testing laboratory’s supervision. Particular attention will be given to any configuration performed to the test environment to accommodate the software that has been installed. The testing laboratory must obtain a copy of any necessary configuration files.

Where a Gaming Platform requires the use of accounts with associated passwords or PIN numbers to remotely access the games, a sufficient number of user accounts and passwords or PIN numbers must be submitted including a method to access the test environment.

A.2.5 Random Number Generator (RNG) Submission Requirements. "RNG" refers to the gaming platform software and / or hardware which determines random outcomes for use by all of the games hosted / offered on the gaming platform. The following sections outline the submission requirements for an RNG.

I. Source Code The following requirements apply to all RNG source code submitted to the testing laboratory:

- a) All RNG source code submitted to the testing laboratory shall be reviewed in a secure, controlled and supervised manner which is agreeable to the testing laboratory, the regulator and the software vendor;
- b) All RNG source code submitted to the testing laboratory shall contain the following information (at a minimum):
 - a. File / module / function name(s),
 - b. Brief description of file / module / function purpose(s).
- c) All RNG source code submitted to the testing laboratory shall be commented in an informative and useful manner;
- d) All RNG source code submitted to the testing laboratory shall be correct, complete and able to be compiled; and
- e) In the event that the submission includes RNG software preloaded and installed onto the hard disks of machines then this need only be submitted once but should be accompanied by the same software on a removable source of media.

II. Documentation The following documentation must be submitted for the RNG evaluation:

- a) A list of all games connected to the RNG (including the associated mathematical Degrees of Freedom (DOFs) for each game).
- b) For hardware-based RNGs:
 - i. Type of hardware RNG device used;

- ii. Technical specifications for the hardware RNG device;
 - iii. Details of any firmware installed on the hardware RNG device;
 - iv. Methods of connecting the hardware RNG device to the gaming platform software;
 - v. Details of all RNG / game implementations, including methods of scaling and mapping.
- c) For software-based RNGs:
- i. Type of mathematical algorithm used;
 - ii. Full details, in technical terms, of the random number generation process and mathematical algorithm theory;
 - iii. Details of the mathematical algorithm's period;
 - iv. Details of the Mathematical algorithm's range;
 - v. Details of the methods for seeding (and re-seeding);
 - vi. Details of the methods implemented for background cycling / activity; and
 - vii. Details of all RNG / game implementation, including methods of scaling and mapping.

III. Hardware In the case of a hardware RNG, the actual hardware device must be submitted for evaluation, along with any device drivers and device documentation needed to perform the evaluation.

A.3 Submissions of Modifications (Partial Submissions) to a Previously Certified Item

A.3.1 General Statement For any update submission (e.g., a revision to existing hardware or software that is currently under review, certified or has been reviewed and not certified), the following information shall be required to process the submission in addition to the requirements set forth in 'Submission Letter Requirements'. All modifications require re-testing, examination, and re-certification by the testing laboratory.

***NOTE:** Modifications to the supporting environment which do not impact the functionality of the component(s) under evaluation need not be resubmitted as these elements are not evaluated in our laboratory in the first place, and are only required to provide the supporting environment for*

the component under test. However, any environmental changes which in any way change the functionality of the component(s) under evaluation must be re-certified. Where there is some doubt over whether a Gaming Platform should be resubmitted then these situations will be considered on a case by case basis.

A.3.2 Hardware Re-Submission. Each hardware re-submission shall:

- a) Identify the individual items being submitted (including part number);
- b) Supply a complete set of schematics, diagrams, data sheets, etc. describing the modification along with the reason for the change(s); and
- c) Provide the updated or new hardware, a description and the method of connection to the original Gaming Platform or hardware components.

A.3.3 Player Account Management Re-Submission. Each Player Account Management component re-submission shall:

- a) Use the same requirements as in the ‘*Player Account Management Submission Requirements*’ listed above except where the documentation has not changed, in which case a resubmission of identical documents is not required.
- b) Include a description of the software change(s) and modules affected;
- c) Include updated functional specifications, where applicable; and
- d) Include an updated source code package for the Gaming Platform, if applicable.

A.3.4 Gaming Platform Re-Submission. Each gaming platform re-submission shall:

- a) Use the same requirements as in the ‘*Gaming Platform Submission Requirements*’ listed above except where the documentation has not changed, in which case, a resubmission of identical documents is not required.
- b) Include a description of the software change(s) and modules affected;
- c) Include updated functional specifications, where applicable; and
- d) Include an updated source code package for the Gaming Platform, if applicable.

A.3.5 Game Re-Submission. Each game re-submission shall:

- a) Use the same requirements as in the ‘*Game Submission Requirements*’ listed above except where the documentation has not changed, in which case a resubmission of identical documents is not required;

- b) Include a description of the software change(s) and modules affected;
- c) Include updated game design documents; and
- d) Include an updated source code package for the Gaming Platform.

A.3.6 Jackpot Re-Submission. Each jackpot re-submission shall:

- a) Use the same requirements as in the ‘*Jackpot Submission Requirements*’ listed above except where the documentation has not changed, in which case, a resubmission of identical documents is not required;
- b) Include a description of the software change(s) and modules affected;
- c) Include updated jackpot specifications; and
- d) Include an updated source code package for the Gaming Platform.

A.3.7 RNG Re-Submission. Each RNG re-submission shall:

- a) Use the same requirements as in the ‘*Random Number Generator (RNG) Submission Requirements*’ listed above except where the documentation has not changed, in which case a resubmission of identical documents is not required;
- b) Include a description of the software change(s) and modules affected;
- c) Include updated RNG design and implementation documents; and
- d) Include an updated source code package for the RNG.

A.3.8 ISS Re-Submission. Each ISS re-submission shall:

- a) Use the same requirements as in the ‘*Information Systems Security (ISS) Submission Requirements*’ listed above except where the documentation has not changed, in which case a resubmission of identical documents is not required;
- b) Include a detailed description of the Gaming Platform change(s) and component(s) affected, as well as the reason(s) for the changes implemented by the operator; and
- c) Include updated ISS design and configuration documents where required.