STANDARD SERIES

GLI-33:

Event Wagering Systems

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ABOUT THIS STANDARD

This technical standard has been produced by **Gaming Laboratories International, LLC (GLI)** for the purpose of providing independent technical analysis and/or certifications to wagering industry stakeholders indicating the state of compliance for wagering operations and systems with the requirements set forth herein.

This document is intended to be used by regulatory bodies, operators, and industry suppliers as a compliance guideline for technologies pertaining to Event Wagering Systems. This standard is not intended to represent a set of prescriptive requirements that every Event Wagering System must comply with; however it does establish a technical standard regarding the technologies used to facilitate these operations. It should be stressed that some of the technical standards addressed within this document may be satisfied through manual operational controls as approved by each regulatory body.

A supplier is expected to provide internal control documentation, credentials and associated access to a production equivalent test environment with a request that it be evaluated in accordance with this technical standard. Upon completion of testing, GLI will provide a certificate of compliance evidencing the certification to this Standard.

GLI-33 should be viewed as a living document that provides a level of guidance that will be tailored periodically to align with this developing industry over time as wagering implementations and operations evolve.

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION TO EVENT WAGERING *7*
1.1 Introduction *7*
1.2 Acknowledgment of Other Standards Reviewed *8*
1.3 Purpose of Technical Standards *8*
1.4 Other Documents That May Apply *9*
1.5 Interpretation of this Document *10*
1.6 Testing and Auditing *10*
CHAPTER 2: EVENT WAGERING REQUIREMENTS *12*
2.1 Introduction *12*
2.2 General Wagering Requirements *12*
2.3 Wager Placement *14*
2.4 Results *17*
2.5 Winnings *18*
2.6 Fixed Odds Wagers *18*
2.7 Pari-Mutuel Wagers *19*
2.8 Additional Features *19*
2.9 Virtual Event Wagering *22*
2.10 External Wagering Systems *25*
CHAPTER 3: WAGERING DEVICE REQUIREMENTS *27*
3.1 Introduction *27*
3.2 Program Requirements *27*
3.3 Wagering Device Operations and Security *28*
CHAPTER 4: SELF-SERVICE WAGERING DEVICES *31*
4.1 Introduction *31*
4.2 Player Safety *31*
4.3 Environmental Effects on Integrity *31*
4.4 Self-Service Wagering Device Identification *32*
4.5 Basic Hardware Requirements *32*
4.6 Electrical Power *33*
4.7 Doors and Security *34*
4.8 Critical Non-Volatile (NV) Memory *35*
4.9 Peripheral Devices *36*
CHAPTER 5: REMOTE WAGERING DEVICES *38*
5.1 Introduction *38*
5.2 Client Software *38*
5.3 Remote Wagering Device Integrity *40*
5.4 Location Detection for Wagering on a Wireless Local Area Network *40*
5.5 Location Detection for Wagering Over the Internet *41*
CHAPTER 6: PLAYER ACCOUNT REQUIREMENTS *43*
6.1 Introduction *43*
6.2 Player Account Registration and Access *43*
6.3 Player Account Controls *46*
6.4 Player Loyalty Programs *51*
CHAPTER 7: SYSTEM AND OPERATOR REQUIREMENTS *52*
7.1 Introduction *52*
7.2 System Clock Requirements *52*
7.3 Control Program *52*
7.4 Shutdown and Recovery *53*
7.5 Wagering Control *55*
7.6 Information to be Maintained *55*
7.7 Reporting *60*

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Diogenes
Exhibit 2008 - Page 005

7.8 Taxation *64*
7.9 Operational Guidelines *64*
CHAPTER 8: SYSTEM SECURITY REQUIREMENTS *66*
8.1 Introduction *66*
8.2 System Operation & Security *66*
8.3 Communication Requirements *68*
8.4 Backup and Recovery *71*
8.5 Technical Controls *73*
8.6 Remote Access and Firewalls *74*
8.7 Change Management *76*
GLOSSARY OF KEY TERMS *78*

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Diogenes
Exhibit 2008 - Page 006

CHAPTER 1: INTRODUCTION TO EVENT WAGERING

1.1 Introduction

***1.1.1. General Statement*. Gaming Laboratories International, LLC (GLI)** has been testing gaming devices since 1989. Over the years, GLI has developed numerous technical standards utilized by jurisdictions all over the world. This document, *GLI-33*, sets forth the Technical Standards for Event Wagering Systems.

***1.1.2 Document History*.** This document is a compilation based upon many standards documents from around the world. Some were written by GLI; others were written by industry regulators with input from independent test laboratories and Event Wagering System manufacturers. GLI has taken each of the standards documents and merged the unique rules, eliminated some rules and updated others, to reflect both the change in technology and the purpose of maintaining an objective standard that achieves common regulatory objectives without unnecessarily impeding technological innovation. GLI lists below, and gives credit to, agencies whose documents were reviewed prior to writing this Standard. It is the policy of GLI to update this document as often as warranted to reflect changes in technology and/or testing methods. This document will be distributed without charge and may be obtained by downloading it from the GLI website at www.gaminglabs.com or by contacting GLI at:

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Exhibit 2008 - Page 007

1.2 Acknowledgment of Other Standards Reviewed

1.2.1 ***General Statement*****.** This technical standard has been developed by reviewing and using portions of the documents from the following organizations. GLI acknowledges and thanks the regulators and other industry participants who have assembled these documents:

a) Nevada Gaming Commission and Gaming Control Board.
b) British Columbia Gaming Policy and Enforcement Branch (GPEB).
c) Association of Racing Commissioners International (ARCI).
d) Tasmanian Liquor and Gaming Commission.
e) Northern Territory Racing Commission.
f) Victorian Commission for Gambling and Liquor Regulation.
g) Danish Gambling Authority.
h) Spanish Directorate General for the Regulation of Gambling (DGOJ).
i) South African Bureau of Standards (SABS).

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 Event Wagering Systems.
b) To test the criteria that impact the credibility and integrity of Event Wagering Systems from both the revenue collection and player's perspective.
c) To create a standard that will ensure wagers on events are fair, secure, and able to be audited and operated correctly.
d) To distinguish between local public policy and Independent Test Laboratory criteria. It is up to each local jurisdiction to set its own public policy with respect to wagering.
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 Event Wagering System should not be incorporated into this standard but instead included within the regulatory operations of the local jurisdictions.

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

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

1.3.2 ***No Limitation of Technology***. One should be cautioned that this document must not be read in such a way that limits the use of future technology. This document should not be interpreted to mean that if the technology is not mentioned, then it is not allowed. To the contrary, GLI will review this standard and make changes to incorporate minimum standards for any new and related technology.

1.3.3 ***Adoption and Observance.*** This GLI technical standard can be adopted in whole or in part by any regulatory body that wishes to implement a comprehensive set of requirements for Event Wagering Systems.

1.4 Other Documents That May Apply

1.4.1 ***Other GLI Standards***. This standard covers the requirements for Event Wagering Systems. Depending on the technology utilized by a system, additional GLI technical standards may also apply.

NOTE: *The entire family of GLI Standards is available free of charge at www.gaminglabs.com.*

1.4.2 ***Operator's Minimum Internal Control Standards (MICS).*** The implementation of an Event Wagering System is a complex task, and as such will require the development of internal process and procedures to ensure that the system is configured and operated with the level of security and control necessary. To that end, it is expected that the operator will establish a set of Minimum Internal Control Specifications (MICS) to define the internal requirements for the creation, management, and handling of wagering transactions as well as the requirements for internal control of any system or component software and hardware, and their associated accounts.

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1.5 Interpretation of this Document

1.5.1 General Statement. This technical standard applies to systems that support wagering on sports, competitions, matches, and other event types approved by the regulatory body. The requirements in this technical standard apply to wagering on events in a way that is general in nature and does not limit or authorize the specific events, markets or types of wagers. The intent is to provide a framework to cover those currently known and permitted by law. This document is not intended to define which parties are responsible for meeting the requirements of this technical standard. It is the responsibility of the stakeholders of each operator to determine how best to meet the requirements laid out in this document.

1.5.2 Software Suppliers and Operators. The components of an Event Wagering System, although they may be constructed in a modular fashion, are designed to work seamlessly together. In addition, Event Wagering System components may be developed to have configurable features, the final configuration of which will depend on the options chosen by the operator. From a testing perspective, it may not be possible to test all of the configurable features of an Event Wagering System component submitted by a software supplier in the absence of the final configuration chosen by the operator; however, the configuration that will be utilized in production must be communicated to the independent test laboratory in support of a creating an functionally equivalent testing environment. Because of the integrated nature of an Event Wagering System, there are a number of requirements in this document which may apply to both operators and suppliers. In these cases, where testing is requested for a “white-label” version of the component, a specific configuration will be tested and reported.

1.6 Testing and Auditing

1.6.1 Phases of Testing. The approval of an Event Wagering System will be certified in two phases:

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Exhibit 2008 - Page 010

a) Initial laboratory testing, where the independent test laboratory will test the integrity of the Event Wagering System in conjunction with Wagering Devices, in the laboratory setting with the equipment assembled; and

b) At a frequency specified by the regulatory body, an on-site operational audit of the production system as required. This may include, but is not limited to, an information security system (ISS) assessment, review of the operational processes that are critical to compliance, penetration testing focused on the external and internal infrastructure as well as the applications transferring, storing and/or processing player credentials and/or sensitive information, and any other objectives established by the regulatory body.

NOTE: *Requirements within this standard can be met with a technical solution evaluated in the laboratory testing phase or alternatively, operational controls to be audited during the on-site phase. It is the recommendation of this standard that any requirement identified as met through operational procedure is documented within the evaluation report and supplements the scope of the periodic operational audit.*

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Exhibit 2008 - Page 011

CHAPTER 2: EVENT WAGERING REQUIREMENTS

2.1 Introduction

2.1.1 ***Introduction.*** This chapter sets forth technical requirements for wagering operations, including, but not limited to rules for creating markets, settling wagers, closing markets, cancellations of events, cancelling wagers.

NOTE: *The display requirements within this chapter apply to information displays for a Wagering Device as supported, websites managed by the venue and/or operator, and/or information that are otherwise provided to players via external signage, forms, or brochures available at a venue.*

2.2 General Wagering Requirements

2.2.1 ***General Statement.*** The following sections describe the information which must be made available to the player through the Wagering Device or upon request at a venue regarding the events, markets, and associated types of wagers available on the Event Wagering System, and the methods for placing a wager on the Event Wagering System. An event may support multiple wagering opportunities, known as markets (e.g., money line, point spread, over/under, etc.).

2.2.2 ***Wagering Rules and Information.*** The following requirements apply to the wagering rules and information including any written, graphical, and auditory information provided to the player:

a) Wagering Device usage instructions, if applicable, payout information, and rules of participation shall be complete and unambiguous and shall not be misleading or unfair to the player.

b) Wagering rules and information, including all wagering eligibility and scoring criteria, available events and markets, line postings, and advertised awards, shall be accessible by

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a player without the need for placing a wager.

c) Payout information shall include all possible winning positions, rankings, and achievements, along with their corresponding payouts, for any available wager option.

d) Any prizes that are offered in the form of merchandise, annuities, lump sum payments, or payment plans instead of cash payouts shall be clearly explained to the player in each market that is offering such a prize.

e) Wagering rules and information that is presented aurally (via sound or voice) shall also be displayed in written form.

f) Wagering rules and information shall be rendered in a color that contrasts with the background color to ensure that all information is clearly visible/readable.

g) Statistical data that is made available to the player pertaining to the event must use a source approved by the regulatory body and shall be reasonably accurate and updated.

h) The wagering rules and information shall clearly explain whether the odds/payouts are locked-in at the time of the wager (e.g., fixed odds), or if the odds/payouts may change dynamically prior to the commencement of the event (e.g., pari-mutuel).

i) The wagering rules and information must clearly state the means by which a winning wager is determined and the handling of an award in any case where a tie is possible.

j) If prizes are to be paid for combinations involving participants other than solely the first place finisher (e.g., in an Olympic competition), the order of the participants that can be involved with these prizes shall be clearly indicated (e.g., result 8-4-7).

k) The rules for any exotic wagering options (e.g., perfecta, trifecta, quinella, etc.) and the expected payouts shall be clearly explained to the player.

l) The wagering rules and information shall disclose any restrictive features of wagering, such as minimum wager amounts or maximum win values.

m) The operator commission amount for each wager, if any, must be indicated to the player.

2.2.3 ***Disclosure of Promotions and/or Bonuses.*** Players must be able to access information pertaining to any available promotions and/or bonuses. This information must be clear and unambiguous, especially where promotions or bonuses are limited to certain events, markets, or when other specific conditions apply.

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2.2.4 ***Access to Current Odds/Payouts and Prices.*** Players must be able to access current odds/payouts and prices for available markets prior to the placement of a wager.

NOTE: *It is accepted that, depending on the medium, communication delays are variable and beyond the knowledge or control of the operator, and the displayed information may be different from the information recognized in the system.*

2.2.5 ***Player Fairness.*** In order to ensure player fairness, the Event Wagering System must identify situations where the player has placed a wager for which the associated odds/payouts or prices have changed, but not yet refreshed on the Wagering Device or external display, and, unless the player has opted in to auto-accept changes as permitted by the regulatory body, notify the player accordingly to confirm the wager given the new values.

2.2.6 ***Advertising.*** All advertising or marketing material that is displayed or otherwise conveyed to the player must not:

a) Contain graphics and/or audio deemed indecent or offensive by the regulatory body;
b) Contain content that contradicts the wagering rules and information or terms and conditions; and
c) Specifically target players that have been excluded from play.

2.3 Wager Placement

2.3.1 ***General Statement.*** Depending on the type of Wagering Device, wagers may be placed directly by the player or on behalf of a player by an attendant. Refer to the chapter entitled "Wagering Device Requirements" for additional information.

2.3.2 ***Selection of a Wager***. The following rules apply to the selection of a specific wager:

a) Players shall have the ability to select the wagering option they want to place a wager on.

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b) No paid wagers shall be automatically placed on behalf of the player without the player's selection, or authorization, which may be given in advance.

c) Players shall have an opportunity to review and confirm their selections for a particular offering before the wager is submitted. This does not preclude the use of "single-click" wagering as permitted by the regulatory body and opted in by the player.

2.3.3 ***Placing Wagers.*** Wagers may be placed either in conjunction with a player account, by funds provided to a Wagering Device, or through interaction with an attendant.

a) The method of placing a wager shall be straightforward, with all selections (including their order, if relevant) made clearly obvious to the player.

b) When the wager involves multiple events (e.g., parlays), such groupings must be clearly obvious to the player.

c) Clear indication shall be provided to the player that a wager has been accepted by the Event Wagering System. Each individual wager shall be acknowledged and clearly indicated to the player separately so that the player is not in doubt as to which wagers have been accepted.

d) If the wager attempt is rejected (in full or in part) by the Event Wagering System, the player is to be informed of the rejection. The wagering rules and information must disclose any reasons for which a wager may get rejected.

e) For paid wagers conducted using a player account:

   i. A Wagering Device shall make the player's balance readily accessible.

   ii. No wager amount may be greater than the player's balance.

   iii. The player's balance is to be debited when the wager is accepted by the system.

2.3.4 ***Wager Record.*** Upon completion of a wagering transaction, the player shall receive a virtual or printed wager record which contains the following information:

a) The date and time the wager was placed;

b) The date and time the event is expected to occur (if known);

c) Any player choices involved in the wager:

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Exhibit 2008 - Page 015

i. Wager selection (e.g., athlete or team name and number);

ii. Type of wager and line postings (e.g., money line bet, point spreads, over/under amounts, win/place/show, etc.);

iii. Any special condition(s) applying to the wager;

d) Total amount wagered, including any promotional/bonus credits (if applicable);

e) Event and market identifiers;

f) Unique identification number of the wager record;

g) For printed wager records, the following must be also included:

i. Venue Name/Site Identifier;

ii. Unique Wagering Device ID which issued the wager record; and

iii. Expiration period (if applicable)**.**

2.3.5 ***Cancellations.*** Wagering transactions cannot be modified except to be cancelled as provided for in the operator's published cancellation policy. The following requirements apply toward wager cancellations:

a) The player must be able to access any policies relative to cancellations, including the prohibition of cancellations (e.g., after a fixed time period);

b) The cancellation policy must cater for wagers with multiple events (e.g., parlays);

c) Player initiated cancellations may be authorized in accordance with the cancellation policy. A cancellation grace period may be offered to allow players to request a cancellation of wagers placed; and

d) Operator initiated cancellations must provide a reason for cancellation to a player (e.g., past-post wager).

2.3.6 ***Wagering Period Close.*** The wagering rules and information shall clearly explain that wagering periods can be closed at the discretion of the operator. It shall not be possible to place wagers once the wagering period has closed.

2.3.7 ***In-Play Wagering.*** The player must be informed that due to varying communication speeds or broadcast transmission latencies:

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a) There may be delays in updates of the displayed information and the player may be at a disadvantage to others who may have more up-to-date information.

b) The Event Wagering System may incorporate delays in the registered time of an in-play wager to prevent past-post wagers and cancellations.

2.4 Results

2.4.1 ***Entering Results.*** Results entry must include the entry of all information which may affect the outcome of all types of wagers offered for that event.

2.4.2 ***Displaying Results.*** The player must be able to view the results of their wagers on any decided market, once they have been confirmed.

a) Players must be able to view any change of results (e.g., due to statistics corrections).

b) Where individual wager amounts are gathered into pools, the player must be able to view the dividends of any decided market.

2.4.3 ***Withdrawn Selections.*** The player must be able to view withdrawn selections for wagers with multiple events (e.g., parlays) through the Wagering Device or upon request at a venue. The wagering rules and information available to the player must clearly state what is to occur when these selections are withdrawn.

2.4.4 ***Cancelled Events and Markets.*** The wagering rules and information available to the player through the Wagering Device or upon request at a venue must clearly state what is to occur when an event or market is cancelled, including the handling of wagers with multiple events (e.g., parlays) where one or more of these legs are cancelled. If an event or market is cancelled for any reason, all associated wagers are to be refunded in full as soon as reasonably possible.

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2.5 Winnings

2.5.1 ***Payment of Winnings.*** Once the results of the event are entered and confirmed, the player may receive payment for their winning wagers. This does not preclude the ability for the player to perform a redemption for an adjusted payout before event conclusion where offered by the Event Wagering System.

NOTE: *Amounts won that exceed any jurisdictional specified limit shall require the appropriate documentation to be completed before the winning player is paid.*

2.5.2 ***Rounding.*** Where the calculation of payouts may involve rounding, information on how the system handles these circumstances must be provided to the player through the Wagering Device or upon request at a venue, which must clearly specify what is to occur:

a) Rounding to what level (e.g., 5 cents) must be clearly explained;
b) Rounding up, down (truncation), true rounding, must be clearly explained; and
c) Metering of rounding amounts must be clearly explained.

2.6 Fixed Odds Wagers

2.6.1 ***Fixed Odds Wagers.*** The following requirements are applicable for types of wagers where the odds/payout is fixed at the time the wager is placed:

a) The Event Wagering System must store a table of all line postings that were available throughout the duration of a market and keep an accurate record of all wagers placed for each posting.
b) The wagering rules and information available to the player through the Wagering Device or upon request at a venue must clearly state that the operator reserves the right to reject or limit a wager for the purposes of limiting liability.

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2.6.2 ***Adjustments to Fixed Prize Payouts.*** The wagering rules and information available to the player through the Wagering Device or upon request at a venue must disclose that the odds/payouts may be adjusted under situations such as:

a) Atypical winning outcomes (e.g., dead heats);
b) Cancelled legs of wagers with multiple events (e.g., parlays); and
c) Prorating.

2.7 Pari-Mutuel Wagers

2.7.1 ***Pari-Mutuel Wagers.*** The following requirements are applicable for types of wagers where individual wagers are gathered into pools:

a) The player must be able to view up-to-date odds/payouts information for simple wagering pools. For complex wagering pools, it is accepted that there may be reasonable limitations to the up-to-date accuracy of the pool estimates displayed to the player.
b) The player must be able to view up-to-date values of total investments for all wagering pools.

2.7.2 ***Dividends.*** The rules for dividend calculation including the prevailing formula for pool allocations and the stipulations of the contest being wagered upon must be approved by the regulatory body and disclosed to the player.

2.8 Additional Features

2.8.1 ***General Statement.*** The requirements within this section pertain to additional features which may be offered by the Event Wagering System where allowed by the regulatory body.

NOTE: *It is recommended that the Event Wagering System supports a secure option to enable or disable each of these features to accommodate regulatory bodies that may either allow or prohibit such features.*

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2.8.2 ***Player Resources.*** An Event Wagering System may contain a resource, such as a data stream that may be used to externally facilitate wager selection for peer-to-peer wagering, provided that the rules are made available to the player:

a) Clearly describe to all players that the resource is available and the advantage it offers;
b) Disclose the method for obtaining the resource; and
c) Provide players with sufficient information to make an informed decision, prior to participation, as to whether or not to participate with player(s) who may possess such a resource.

2.8.3 ***Player Advice Features.*** An Event Wagering System may support a feature that offers advice, hints, or suggestions to a player provided that it conforms to the following requirements:

a) The player advice feature shall clearly describe to the player that it is available and the options that exist for selection;
b) Any player advice that is offered to the player for purchase shall clearly disclose the cost and benefit;
c) The player advice feature shall allow the player the option of accepting the advice, and must not force the player to accept the assistance; and
d) The availability and content of player advice shall remain consistent for all players.

2.8.4 ***Automatic Acceptance of Changes in Wagers.*** An Event Wagering System may support a feature that allows a player while placing a wager to auto-accept changes in odds/payouts or price of the wager provided that it conforms to the following requirements:

a) Any auto-accept options available (e.g., auto-accepting all wagers with higher price, auto-accepting all wagers with lower price, etc) must be explained to the player;
b) The player must opt in to use this functionality (i.e., it should not be set by default); and
c) The player must be able to opt out at any time.

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2.8.5 ***Contests/Tournaments.*** A contest/tournament, in which permits a player to either purchase or be awarded the opportunity to engage in competitive wagering against other players, may be permitted providing the following rules are met:

a) Rules shall be made available to a player for review prior to registering for the contest/tournament. The rules must include at a minimum:
   i. All conditions registered players must meet to qualify for entry into, and advancement through, the contest/tournament;
   ii. Specific information pertaining to any single contest/tournament, including the available prizes or awards;
   iii. For a contest/tournament with multiple awards, the distribution of funds based on specific outcomes; and
   iv. The name of the organization (or persons) that conducted the contest/tournament on behalf of, or in conjunction with, the operator if applicable.

b) The results of each contest/tournament shall be made available for the registered players to review. Subsequent to being posted publically, the results of each contest/tournament shall be made available upon request. The results include the following:
   i. Name of the contest/tournament;
   ii. Date(s)/times(s) of the contest/tournament;
   iii. Total number of entries;
   iv. Amount of entry fees;
   v. Total prize pool; and
   vi. Amount paid for each winning category.

NOTE: *For free contests/tournaments (i.e., registered player does not pay an entry fee), the information required by the above must be recorded except for the number of entries, amount of entry fees and total prize pool.*

2.8.6 ***Free Play Mode.*** An Event Wagering System may support free play mode, which allows a player to participate in wagering without paying. Free play mode shall not mislead the player about the odds/payouts available in the paid version.

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2.9 Virtual Event Wagering

2.9.1 ***General Statement***. Virtual event wagering allows for the placement of wagers on simulations of sporting events, contests, and races whose results are based solely on the output of an approved Random Number Generator (RNG) as allowed by the regulatory body. The following requirements are only applicable to cases where virtual event wagering is conducted in total by the Event Wagering System where a wager is placed at a Wagering Device or through interaction with an attendant and then the virtual event is displayed via a public or common display. For virtual events conducted by a gaming device (e.g., player makes a wager and the event plays out before them on their machine or a shared display on a multi-player machine), please refer to *GLI-11 Gaming Devices* as applicable.

2.9.2 ***Randomization and Virtual Events.*** A cryptographic RNG must be utilized to determine virtual event outcomes and shall comply with applicable requirements set out for RNGs. In the absence of specific jurisdictional standards, the "Random Number Generator (RNG) Requirements" chapter of *GLI-11 Gaming Devices* should be used as applicable. Additionally, the evaluation of virtual event outcomes using an RNG shall comply with the following rules:

a) Where more than one RNG is used to determine different virtual event outcomes, each RNG shall be separately evaluated; and
b) Where each instance of an RNG is identical, but involves a different implementation within the virtual event, each implementation shall be separately evaluated.

2.9.3 ***Virtual Event Selection Process.*** Determination of events of chance that result in a monetary award shall not be influenced, affected, or controlled by anything other than the values selected by an approved RNG within the Event Wagering System, in accordance with the following requirements:

a) It shall not be possible to ascertain the outcome of the virtual event prior to its commencement;

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Exhibit 2008 - Page 022

b) When making calls to the RNG, the virtual event shall not limit the outcomes available for selection, except as provided for by design;

c) The virtual event shall not modify or discard outcomes selected by the RNG due to adaptive behavior. Additionally, outcomes shall be used as directed by the rules of the virtual event;

d) Subsequent to the commencement of a virtual event, no subsequent actions or decisions shall be made that change the behavior of any of the elements of chance within the virtual event, other than player decisions;

e) Except as provided for by the rules of the virtual event, events of chance shall be independent and shall not correlate with any other events within the same virtual event, or events within previous virtual events;

f) Any associated equipment used in conjunction with an Event Wagering System shall not influence or modify the behaviors of the Event Wagering System's RNG and/or random selection process, except as authorized, or intended by design;

g) Virtual event outcomes shall not be affected by the effective bandwidth, link utilization, bit error rate or other characteristic of the communications channel between the Event Wagering System and the Wagering Device; and

h) Wagering Devices shall not contain any logic utilized to generate the result of any virtual event. All critical functions including the generation of any virtual event shall be generated by the Event Wagering System and be independent of the Wagering Device.

2.9.4 ***Virtual Event Display.*** Displays for a virtual event shall conform to applicable display requirements of this standard. In addition, the following display requirements apply:

a) Statistical data that is made available to the player pertaining to the virtual event shall not misrepresent the capabilities of any virtual participant. This does not prevent the use of an element of chance or randomness from impacting performance of the virtual participant during the virtual event;

b) For scheduled virtual events, a countdown of the time remaining to place a wager in that event shall be displayed to the player. It shall not be possible to place wagers on the event

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once this time has passed, however, this requirement does not prohibit the implementation of in-play wagers; and

c) The final outcome of each virtual event shall be displayed for a sufficient length of time that permits a player a reasonable opportunity to verify the virtual event's outcome.

2.9.5 ***Simulation of Physical Objects.*** Where a virtual event incorporates a graphical representation or simulation of a physical object that is used to determine virtual event outcome, the behaviors portrayed by the simulation must be consistent, unless otherwise denoted by the virtual event rules. This requirement shall not apply to graphical representations or simulations that are utilized for entertainment purposes only. The following shall apply to the simulation:

a) The probability of any event occurring in the simulation that affects the outcome of the virtual event shall be analogous to the properties of the physical object;

b) Where the virtual event simulates multiple physical objects that would normally be expected to be independent of one another based on the rules of the virtual event, each simulation must be independent of any other simulations; and

c) Where the virtual event simulates physical objects that have no memory of previous events, the behavior of the simulated objects must be independent of their previous behavior, so as to be non-adaptive and non-predictable, unless otherwise disclosed to the player.

2.9.6 ***Physics Engine.*** Virtual events may utilize a "physics engine" which is specialized software that approximates or simulates a physical environment, including behaviors such as motion, gravity, speed, acceleration, inertia, trajectory, etc. A physics engine shall be designed to maintain consistent play behaviors and virtual event environment, unless an indication is otherwise provided to the player by the virtual event rules. A physics engine may utilize the random properties of an RNG to impact virtual event outcome.

NOTE: *Implementations of a physics engine in a virtual event will be evaluated on a case-by-case basis by the independent test laboratory.*

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2.10 External Wagering Systems

2.10.1 General Statement. This section contains requirements for wagers placed through the Event Wagering System that are forwarded to an external wagering system which controls the wagering, processes results and determines winning wagers. An example might be the Event Wagering System interfacing to a totalisator system. The requirements of this section apply towards the interoperability of the Event Wagering System with the external wagering system and not a complete evaluation of the external wagering system itself.

NOTE: *The external wagering system may independently be subject to evaluation by the independent test laboratory per regulatory body discretion.*

2.10.2 Information. The following requirements apply to information being conveyed to the Event Wagering System by an external wagering system:

a) If the external wagering system provides pari-mutuel wagering facilities for the Event Wagering System, the Event Wagering System must be able to periodically receive the current dividends estimates for active pools from the external wagering system.

b) If the external wagering system provides fixed price wagering facilities for the Event Wagering System where the odds/payouts can be dynamically changed, the Event Wagering System must be able to receive the current odds from the external wagering system whenever any odds are changed.

c) The Event Wagering System must be able to receive change of event status information from the external wagering system whenever any change occurs, including:
   i. Withdrawn/reinstated selections;
   ii. Altered event starting time;
   iii. Individual markets opened/closed;
   iv. Results entered/modified;
   v. Results confirmed; and
   vi. Event cancelled.

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2.10.3 ***Wagers.*** If wager placement or pricing information is interfaced through an external wagering system, the following requirements apply:

a) Wagers placed on the Event Wagering System must receive clear acknowledgment of acceptance, partial acceptance (including details), or rejection by the external wagering system.

b) If the cost of the wager is determined by the external wagering system, there must be a positive confirmation sequence in place to enable the player to accept the wager cost and the Event Wagering System to determine that there are enough funds in the player's balance to meet the wager cost prior to making an offer to an external wagering system.

c) Where wagers may be placed in bulk, the following requirements apply:

   i. If the stream of wagers is interrupted for any reason, there must be a means available to determine where in the stream that the interruption occurred.

   ii. No wager in the stream may be greater than the current remaining balance of the account. If such a bet is attempted, the entire stream is to be halted.

d) The player's balance shall be debited an amount equaling the offer and cost to the external wagering system. The funds shall remain as a pending transaction with details of the offer to the external wagering system logged. On receipt of acknowledgment from the external wagering system, the appropriate adjustments shall be made to the "pending" account and the player's balance.

e) Cancellation requests from the Event Wagering System must receive clear acknowledgment of acceptance or rejection by the external wagering system. The player is not to be credited by the Event Wagering System until final confirmation is received from the external wagering system including the amount of the cancelled wager.

2.10.4 ***Results.*** When results are entered and confirmed on the external wagering system, each winning wager must be transferred to the Event Wagering System with the amount of the win. Confirmation of receipt of the winning wagers must be acknowledged by the Event Wagering System.

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CHAPTER 3: WAGERING DEVICE REQUIREMENTS

3.1 Introduction

3.1.1 ***Introduction***. A wager may be placed using one of the following types of Wagering Devices as allowed by the regulatory body. Any other types of Wagering Devices will be reviewed on a case-by-case basis, as allowed by the regulatory body.

a) Point-of-Sale Wagering Device: A player may place a wager from a venue-controlled Point-of-Sale Wagering Device by using funds from their player account or by providing payment for the wager(s) directly to the attendant.

b) Self-Service Wagering Device: A player may place a wager on the venue-controlled Self-Service Wagering Device by using funds from their player account or through the use of peripheral devices as authorized by the regulatory body. In addition to the requirements of this chapter, the "Self-Service Wagering Devices" chapter of this document shall also be met for all proprietary components.

c) Remote Wagering Device: A player may only place a wager on their Remote Wagering Device by using funds from their player account. In addition to the requirements of this chapter, the "Remote Wagering Devices" chapter of this document shall also be met.

NOTE: *Unless otherwise specified the requirements within this chapter refer to all types of Wagering Devices. The term "venue-controlled Wagering Devices" refers to Self-Service Wagering Devices and Point-of-Sale Wagering Devices.*

3.2 Program Requirements

3.2.1 ***Program Identification***. All Wagering Device programs shall contain sufficient information to identify the software and revision level of the information stored on the Wagering Device.

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NOTE: *The process used in the identification of the software and revision level will be evaluated on a case-by-case basis.*

3.2.2 ***Program Validation.*** The Event Wagering System shall have the ability to authenticate that all critical components being utilized on the Wagering Device are valid upon installation of the software, each time the software is loaded for use, and on demand as required by the regulatory body. Critical components may include, but are not limited to, wagering rules and information, elements that control the communications with the Event Wagering System, or other components that are needed to ensure proper operation of the Wagering Device. In the event of a failed authentication (i.e., program mismatch or authentication failure), the Wagering Device shall cease all wagering operations and display an appropriate error message.

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

3.2.3 ***Independent Software Verification***. The Wagering Device shall have the ability to allow for an independent integrity check of the device's software from an outside source. This verification is required for all programs that affect integrity. The verification shall be accomplished by being authenticated by a third-party application run from the device, by allowing a third-party device to authenticate the media, or by allowing for removal of the media such that it can be verified external to the Wagering Device. The independent test laboratory, prior to device approval, shall evaluate the integrity check method.

3.3 Wagering Device Operations and Security

3.3.1 ***Touch Screen Displays***. Touch screen displays, if in use, shall be accurate, and if required by their design, shall support a calibration method to maintain that accuracy; alternatively, the display hardware may support automatic self-calibration.

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Diogenes
Exhibit 2008 - Page 028

3.3.2 ***User Interface Requirements.*** The user interface is defined as an application or program through which the user views and/or interacts with the Wagering Device software to communicate their actions to the Event Wagering System. The user interface shall meet the following:

a) The functions of all buttons, touch or click points shall be clearly indicated within the area of the button, or touch/click point and/or within the help menu. There shall be no functionality available through any buttons or touch/click points on the user interface that are undocumented.

b) Any resizing or overlay of the user interface must be mapped accurately to reflect the revised display and touch/click points.

c) The display of the instructions and information shall be adapted to the user interface. For example, where a Wagering Device uses technologies with a smaller display screen, it is permissible to present an abridged version of the wagering rules and information accessible directly from within the wagering screen and make available the full/complete version of the wagering rules and information via another method, such as a secondary screen, help menu, or other interface that is easily identified on the visual wagering screen.

3.3.3 ***Simultaneous Inputs.*** The Wagering Device shall not be adversely affected by the simultaneous or sequential activation of the various inputs and outputs which might, whether intentionally or not, cause malfunctions or invalid results.

3.3.4 ***Communications.*** A Wagering Device must be designed or programmed such that it may only communicate with authorized Event Wagering Systems components.

a) The Event Wagering System must have the capability to uniquely identify and authorize each Wagering Device used to place wagers or handle financial transactions.

b) If communication between the Event Wagering System and the Wagering Device is lost, the Wagering Device shall cease wagering operations and display an appropriate error message.

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3.3.5 ***Access Controls*****.** Access to the venue-controlled Wagering Device software by an attendant shall be controlled by a secure logon procedure or other secure process approved by the regulatory body. It must not be possible to modify the configuration settings of the Wagering Device without an authorized secure process.

a) An attendant session is initiated by the attendant logging in to their controlled account using their secure username and password or an alternative means for the attendant to provide identification information as allowed by the regulatory body.

b) All available options presented shall be tied to the account of the attendant logged in. Only access available to the logged in account shall be available through the Wagering Device.

c) If the Wagering Device does not receive input from the attendant within 5 minutes, or a period of time specified by the regulatory body, the attendant session shall time out.

   i. The attendant may establish a new session by re-establishing their login with the Wagering Device. This process shall include, at a minimum, the manual entry of the attendant's secure password or other accepted methods.

   ii. No further attendant functionality is permitted until a new session is established.

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Exhibit 2008 - Page 030

CHAPTER 4: SELF-SERVICE WAGERING DEVICES

4.1 Introduction

4.1.1 ***Introduction***. This chapter applies to wagers and financial transactions conducted using Self-Service Wagering Devices. All proprietary devices developed for Self-Service Wagering Devices must meet the applicable requirements within this chapter. This chapter does not apply to devices that solely utilize unaltered off-the-shelf products, such as PCs or tablets.

4.2 Player Safety

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

4.3 Environmental Effects on Integrity

4.3.1 ***Self-Service Wagering Device Integrity***. The independent test laboratory shall perform certain tests to determine whether or not an Electro-Static Discharge (ESD) impacts the integrity of a Self-Service Wagering Device. ESD testing is intended to simulate techniques observed in

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Exhibit 2008 - Page 031

the field that may be used in an attempt to disrupt the integrity of a Self-Service Wagering Device.

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

4.4 Self-Service Wagering Device Identification

4.4.1 ***Identification Badge***. A Self-Service Wagering Device shall have an identification badge affixed to the exterior of the device by the manufacturer. The identification badge shall not be removable without leaving evidence of tampering. This badge shall include the following minimum information:

a) The complete name of the manufacturer or some appropriate abbreviation for same;
b) A unique serial number;
c) The Self-Service Wagering Device model number; and
d) The date of manufacture.

4.5 Basic Hardware Requirements

4.5.1 ***Printed Circuit Board (PCB) Identification Requirements***. Identification for any PCB that impacts the integrity of the Self-Service Wagering Device shall include the following:

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a) Each PCB shall be clearly identifiable by an alphanumeric identification and, when applicable, a revision number. It is recommended that this identification be readily viewable without removal of the PCB from the Self-Service Wagering Device; and

b) If track cuts, patch wires, or other circuit alterations are introduced to the PCB, then a new revision number shall be assigned.

4.5.2 ***Switches and Jumpers.*** If the Self-Service Wagering Device contains switches and/or jumpers, they shall be fully documented for evaluation by the independent test laboratory.

4.5.3 ***Device Wiring.*** The Self-Service Wagering Device shall be designed so that power and data cables into and out of the Self-Service Wagering Device can be routed so that they are not accessible to the general public.

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

4.5.4 ***Wired Communication Ports.*** Wired communication ports shall be clearly labeled and must be securely housed within the Self-Service Wagering Device to prevent unauthorized access to the ports or their associated cable connectors.

4.6 Electrical Power

4.6.1 ***Power Surges.*** The Self-Service Wagering Device shall not be adversely affected, other than resets, by surges or dips of ± 20% of the supply voltage. It is acceptable for the Self-Service Wagering Device to reset provided no damage to the equipment or loss or corruption of data is experienced.

4.6.2 ***Circuit Protection.*** The power supply used in a Self-Service Wagering Device must be appropriately fused or protected by circuit breakers. The amperage rating of all fuses and circuit breakers must be clearly stated on or near the fuse or the breaker.

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4.6.3 ***On/Off Switch***. An on/off switch that controls the electrical current supplied to the Self-Service Wagering Device shall be located in a place which is readily accessible within the interior of the Self-Service Wagering Device. The on/off positions of the switch shall be clearly labeled.

4.7 Doors and Security

4.7.1 ***Physical Security***. A Self-Service Wagering Device shall be robust enough to resist forced entry into any secured doors, areas, or compartments. In the event that extreme force is applied to the cabinet materials causing a potential breach in Self-Service Wagering Device security, evidence of tampering must be conspicuous. "Secured areas" or "secured compartments" shall include the external doors such as the main door, cash compartment doors such as a drop box door, peripheral device access area(s), and/or other sensitive access areas of the Self-Service Wagering Device.

4.7.2 ***External Doors***. The following requirements apply to the Self-Service Wagering Device's external doors:

a) External doors shall be manufactured of materials that are suitable for allowing only legitimate access to the inside of the Self-Service Wagering Device cabinet. Doors and their associated hinges shall be capable of withstanding determined and unauthorized efforts to gain access to the interior of the Self-Service Wagering Device and shall leave conspicuous evidence of tampering if such an attempt is made;

b) The seal between the Self-Service Wagering Device cabinet and the door of a locked area shall be designed to resist the entry of objects. It shall not be possible to insert an object into the Self-Service Wagering Device that disables a door open sensor when the Self-Service Wagering Device's door is fully closed, without leaving conspicuous evidence of tampering; and

c) All external doors shall be secure and support the installation of locks.

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Diogenes
Exhibit 2008 - Page 034

4.7.3 ***Door Monitoring***. All doors that provide access to secure areas of the Self-Service Wagering Device shall be monitored by a door access detection system.

a) The detection system shall register a door as being open when the door is moved from its fully closed and locked position, provided power is supplied to the Self-Service Wagering Device.

b) When any door that provides access to a secured area or secured compartment registers as open, the Self-Service Wagering Device shall cease all wagering operations, and display an appropriate error message

4.8 Critical Non-Volatile (NV) Memory

4.8.1 ***Contents of Critical NV Memory.*** Critical Non-Volatile (NV) memory shall be used to store all data elements that are considered vital to the continued operation of the Self-Service Wagering Device, including, but are not limited to Self-Service Wagering Device configuration data and state of operations. Critical NV memory shall not store sensitive information outside of Self-Service Wagering Device operations.

NOTE: *Critical NV memory may be maintained by any component(s) of the Event Wagering System.*

4.8.2 ***Critical NV Memory Backup***. The Self-Service Wagering Device must have a backup or archive capability, which allows the recovery of critical NV memory should a failure occur.

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

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Exhibit 2008 - Page 035

4.8.4 ***Critical NV Memory Checks***. Comprehensive checks of critical NV memory data elements shall be made on startup. NV memory that is not critical to Self-Service Wagering Device integrity is not required to be checked.

4.8.5 ***Unrecoverable Corruption of Critical NV Memory.*** An unrecoverable corruption of critical NV memory shall result in an error. Upon detection, the Self-Service Wagering Device software shall cease to function. Additionally, the critical NV memory error shall cause any communication external to the Self-Service Wagering Device to cease.

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

4.9 Peripheral Devices

4.9.1 ***General Statement.*** A peripheral is defined as an internal or external device connected to a Self-Service Wagering Device that supports credit acceptance, credit issuance, player identification, wager record issuance/redemption, or other specialized function(s). The following requirements apply for Self-Service Wagering Device peripherals as supported:

a) Bill validators must meet the applicable jurisdictional requirements for bill validators. In the absence of specific jurisdictional standards the requirements established within the "Bill Validators and Stackers" section of *GLI-11 Gaming Devices* should be used as applicable.

b) Coin acceptors must meet the applicable jurisdictional requirements for coin acceptors. In the absence of specific jurisdictional standards the requirements established within the "Coin Acceptors, Diverters, and Drop Boxes" section of *GLI-11 Gaming Devices* should be used as applicable.

c) Player identification components, including card readers, must meet the applicable jurisdictional requirements for these components. In the absence of specific jurisdictional

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Exhibit 2008 - Page 036

standards the requirements established within the "Integrated Player Identification Components" section of *GLI-11 Gaming Devices* and "Card Reader Requirements" of *GLI-16 Cashless Systems* should be used as applicable.

d) Hoppers and/or printers must meet the applicable jurisdictional requirements for these devices. In the absence of specific jurisdictional standards the requirements established within the "Machine Payment and Payment Devices" section of *GLI-11 Gaming Devices* and the "Voucher Validation System Requirements" of *GLI-13 On-Line Monitoring and Control Systems (MCS) and Validation Systems* should be used as applicable.

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CHAPTER 5: REMOTE WAGERING DEVICES

5.1 Introduction

5.1.1 ***Introduction***. This chapter applies to wagers and financial transactions conducted using Remote Wagering Devices. The player may obtain/download an application or software package containing the Client Software, or access the Client Software via a browser interface. Depending on the implementation(s) authorized by the regulatory body, Remote Wagering Devices may be used on an in-venue wireless network or an over the internet environment.

5.2 Client Software

5.2.1 ***Client Software Functionality*****.** The Client Software is any software downloaded to or installed on a Remote Wagering Device which is used to take part in wagers and financial transactions with the Event Wagering System and shall meet the following requirements:

a) Players shall not be able to use the Client Software to transfer data to one another, other than chat functions (e.g., text, voice, video, etc.) and approved files (e.g., user profile pictures, photos, etc.);
b) The Client Software must not automatically alter any device-specified firewall rules to open ports that are blocked by either a hardware or software firewall;
c) The Client Software must not access any ports (either automatically or by prompting the user to manually access) which are not necessary for the communication between the Remote Wagering Device and the server;
d) If the Client Software includes additional non-wagering related functionality, this additional functionality shall not alter the software's integrity in any way;
e) The Client Software shall not possess the ability to override the volume settings of the Remote Wagering Device; and
f) It is recommended that auto complete, password caching, or other methods that will fill in the password field are disabled by default for Client Software.

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5.2.3 ***Compatibility Verification*****.** During any installation or initialization and prior to commencing wagering operations, the Client Software used in conjunction with the Event Wagering System must detect any incompatibilities or resource limitations with the Remote Wagering Device that would prevent proper operation of the software. If any incompatibilities or resource limitations are detected the Event Wagering System shall:

a) Provide notification of any incompatibility and/or resource limitation preventing operation (e.g., software version, minimum specifications not met, browser type, browser version, plug-in version, etc.); and
b) Prevent wagering operations while the incompatibility or resource limitation exists.

5.2.4 ***Content*****.** Client Software shall not contain any functionality deemed to be malicious in nature by the regulatory body. This includes, but is not limited to, unauthorized file extraction/transfers, unauthorized device modifications, unauthorized access to any locally stored personal information (e.g., contacts, calendar, etc.) and malware.

5.2.5 ***Cookies*****.** Where cookies are used, the operator shall take reasonable measures to ensure that such cookies do not contain malicious code, and players must be informed of the cookie use upon installation or during registration. When cookies are required for wagering, wagering cannot occur if the Remote Wagering Device does not accept them.

5.2.6 ***Player Inactivity*****.** After 30 minutes of inactivity or a period of time determined by the regulatory body, the Event Wagering System shall require a player to re-authenticate in order to access their player account.

a) No further wagering or financial transactions are permitted on the Remote Wagering Device until the player has been re-authenticated.
b) The Client Software may allow a simpler means for a player to re-authenticate, such as operating system level authentication (e.g., biometrics) or a Personal Identification Number (PIN). Each means for re-authentication will be evaluated on a case-by-case

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basis by the independent test laboratory.

i. This functionality may be disabled based on preference of the player and/or regulatory body.

ii. Once every 30 days, or a period specified by the regulatory body, the player will be required to provide full authentication.

5.3 Remote Wagering Device Integrity

5.3.1 ***Remote Wagering Device Integrity*****.** To ensure the integrity of the Remote Wagering Device, the Event Wagering System shall use software to detect the use of remote desktop software, rootkits, virtualization, and/or any other programs identified as having the ability to circumvent location detection. This software shall follow best practice security measures to:

a) Detect and block location data fraud (e.g., fake location apps, virtual machines, remote desktop programs, etc.);

b) Examine the IP address to ensure a known Virtual Private Network (VPN) or proxy service is not in use;

c) Detect and block devices which indicate system-level tampering (e.g., rooting, jailbreaking, etc.);

d) Utilize detection and blocking mechanisms verifiable to an application level;

e) Stop "man in the middle" attacks or similar hacking techniques and prevent code manipulation; and

f) Monitor and prevent wagers placed by a player account from geographically inconsistent locations (e.g., wager placement locations were identified that would be impossible to travel between in the time reported).

5.4 Location Detection for Wagering on a Wireless Local Area Network

5.4.1 ***Location Tracking Component.*** The Event Wagering System shall incorporate a location tracking component that can track the locations of all Remote Wagering Devices connected to

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the Wireless Local Area Network (WLAN) in real-time. The system shall detect when any devices have been transported out of the permitted area and prevent further wagers from being placed. This can be accomplished with the use of specific IT hardware such as directional antennas, Bluetooth sensors or other methods to be evaluated on a case-by-case basis by the independent test laboratory.

5.5 Location Detection for Wagering Over the Internet

5.5.1 ***Location Detection*****.** The Event Wagering System must utilize a location service or application to reasonably detect and dynamically monitor the location of a player attempting to place a wager; and to monitor and enable the blocking of unauthorized attempts to place a wager.

a) Each player must pass a location check prior to completing the first wager.
b) Subsequent location checks must occur prior to completing wagers after a period of 30 minutes, or as otherwise specified by the regulatory body, since the previous location check.
c) If the location check indicates the player is outside the permitted boundary, the wager shall be rejected and the player shall be notified of this.

5.5.2 ***Location Data Accuracy*****.** To ensure location data is accurate and reliable, a geolocation method shall be used to provide a player's physical location and an associated confidence radius. The confidence radius shall be entirely located within the permitted boundary. In addition, the geolocation method shall:

a) Utilize accurate location data sources (Wi-Fi, GSM, GPS, etc.) to confirm the player's location. If a Remote Wagering Device's only available location data source is an IP Address, the location data of a mobile device registered to the player account may be used as a supporting location data source under the following conditions:
    i. The Remote Wagering Device (where the wager is being placed) and the mobile device must be determined to be in close proximity to one another.

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Diogenes
Exhibit 2008 - Page 041

ii. If allowed by the regulatory body, carrier based location data of a mobile device may be used if no other location data sources other than IP Addresses are available.

b) Possess the ability to control whether the accuracy radius of the location data source is permitted to overlap or exceed defined buffer zones or the permitted boundary; and

c) Utilize boundary polygons based on audited maps approved by the regulatory body as well as overlay location data onto these boundary polygons in order to mitigate and account for discrepancies between mapping sources and variances in geospatial data.

5.5.3 ***Reporting and Analytics*****.** Given that location fraud must be assessed on a single location check, as well as cumulative player histories over time, the location service or application shall:

a) Display a real-time data feed of all location checks;

b) Display an up-to-date list of potential fraud risks;

c) Offer an alert system to identify unauthorized or improper access; and

d) Record in a time stamped log any time a location violation is detected, including all associated location(s) and unique player ID(s).

5.5.4 ***Maintenance*****.** To maintain the overall integrity of the location service or application, it shall:

a) Be reviewed regularly to assess and measure its continued ability to detect and mitigate existing and emerging location fraud risks;

b) Undergo frequent updates to maintain cutting-edge data collection, device compatibility, and fraud prevention capabilities; and

c) Utilize databases (IP, proxy, fraud, etc.) that are updated daily at minimum and are not open-source.

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CHAPTER 6: PLAYER ACCOUNT REQUIREMENTS

6.1 Introduction

6.1.1 ***Introduction***. The following chapter applies to player account management, including player registration and player account controls.

6.2 Player Account Registration and Access

6.2.1 ***Player Account Registration.*** The operator must employ a method to collect (either online or via a manual procedure approved by the regulatory body) player information prior to the registration of a player account. The operator must conform to limits for financial transactions as specified in the terms and conditions or as set by the regulatory body until registration information is verified.

6.2.2 ***Age and Identity Verification.*** A full identity check must be undertaken before a player is allowed to place a wager:

a) Only players of the legal participation age for the jurisdiction may deposit funds or participate in wagering. The operator must deny the ability to deposit funds or participate in wagering to any person that submits a birth date that indicates they are under the legal participation age.
b) Player verification must authenticate the legal name, physical address, age and nationality of the individual at a minimum as required by the regulatory body.
c) Player verification must also confirm that the player is not on any exclusion lists held by the operator or the regulatory body.
d) Details of player verification must be kept in a secure manner.
e) Third party service providers may be used to verify the age and/or identity of players as allowed by the regulatory body.
f) The operator must have a documented public policy for the handling of players

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discovered to be using an account in a fraudulent manner, including but not limited to:

i. The maintenance of information about any player's activity, such that if fraudulent activity is detected, the regulatory body has all of the necessary information to take appropriate action;

ii. The suspension of any player account discovered to be providing access to fraudulent players; and

iii. The treatment of deposits, wagers, and wins associated with a fraudulent player's account.

6.2.3 ***Terms and Conditions.*** A set of terms and conditions must be readily accessible to the player. During the registration process and when any terms and conditions are updated, the player must agree to the terms and conditions.

a) The terms and conditions must clearly define the rules by which any unrecoverable malfunctions of hardware/software are addressed including if this process results in the voiding of any wagers.

b) The terms and conditions must describe procedures to deal with interruptions caused by the discontinuity of data flow from the network server during an event.

c) The terms and conditions must advise the player to keep their account credentials (e.g., password and username) secure; requirements regarding forced password changes, password strength and other related items shall also be specified, as applicable.

d) The terms and conditions must state that no underage individual is permitted to participate in wagering.

e) The terms and conditions must state that only players legally permitted by their respective jurisdiction can participate in wagering.

f) The terms and conditions must specify the conditions under which an account is declared inactive and explain what actions will be undertaken on the account once this declaration is made.

g) The terms and conditions must clearly define what happens to the wagers placed if a player has placed wagers prior to any self-imposed or operator-imposed exclusion, including the return of all wagers to the players, or settling all wagers, as appropriate.

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6.2.4 ***Privacy.*** A privacy policy must be readily accessible to the player. During the registration process and when the privacy policy is updated, the player must agree to the privacy policy.

a) The privacy policy must state the information that is required to be collected, the purpose for information collection, the period in which the information is stored, the conditions under which information may be disclosed and an affirmation that controls are in place to prevent the unauthorized or unnecessary disclosure of the information.

b) Any information obtained in respect to player registration or account establishment must be done in compliance with the privacy policy and local privacy regulations and standards observed by the regulatory body.

c) Any information about player accounts which is not subject to disclosure pursuant to the privacy policy must be kept confidential, except where the release of that information is required by law.

d) All player information must be securely erased (i.e., not just deleted) from hard disks, magnetic tapes, solid state memory and other storage devices before the device is decommissioned. If erasure is not possible, the storage device must be destroyed.

6.2.5 ***Establishment of Player Account.*** Once age and identity verification are successfully completed, the player is determined to not be on any exclusion lists, and the player has acknowledged all of the necessary privacy policies and terms and conditions, then the player account registration is complete and the player account can become active.

a) A player must only be permitted to have one active player account at a time unless specifically authorized by the regulatory body.

b) A player accesses their player account through the use of a username (or similar) and a password or a secure alternative means for the player to perform authentication to log in. Authentication methods are subject to the discretion of the regulatory body as necessary. The requirement does not prohibit the option for more than one method of authentication being available for a player to access their account.

c) Where a player has forgotten their username and/or password, a multi-factor

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authentication process must be employed for the retrieval of the username/resetting of the password. Any and all processes for dealing with lost usernames or passwords must be clearly disclosed to the player and sufficiently secure.

d) The Event Wagering System must allow players to change their passwords, and remind them on a regular basis.

e) A multi-factor authentication process must be employed for changes to a player's registration information and/or account used for financial transactions.

f) The Event Wagering System must support a mechanism that allows for an account to be locked in the event that suspicious activity is detected (e.g., too many failed attempts for login). A multi-factor authentication process must be employed for the account to be unlocked.

6.3 Player Account Controls

6.3.1 ***Player Protection.*** Player protection information must be readily accessible to the player. The player protection information must contain at a minimum:

a) Information about potential risks associated with excessive participation, and where to get help related to wagering responsibly;

b) A list of the available player protection measures that can be invoked by the player, such as self-imposed limits, and information on how to invoke those measures; and

c) Mechanisms in place which detect unauthorized use of their account, such as reviewing credit card statements against known deposits;

6.3.2 ***Self-Imposed Limits.*** Players must be provided with an easy and obvious method to impose limitations for wagering parameters including, but not limited to, deposits, wagers and losses, as required by the regulatory body. The self-imposed limitation method must provide the following functionality:

a) Upon receiving any self-imposed limitation order, the operator must ensure that all specified limits are correctly implemented immediately or at the point in time (e.g., next

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login, next day) that was clearly indicated to the player;

b) The self-imposed limitations set by a player must not override more restrictive operator-imposed limitations. The more restrictive limitations must take priority;

c) Once established by a player and implemented by the Event Wagering System, it must only be possible to reduce the severity of self-imposed limitations upon 24 hours notice, or as required by the regulatory body; and

d) Self-imposed limitations must not be compromised by internal status events, such as self-imposed exclusion orders and revocations.

6.3.3 ***Operator-Imposed Limits.*** The operator must be capable of applying limitations for wagering parameters including, but not limited to, deposits, wagers and losses, as required by the regulatory body. The operator-imposed limitation method must provide the following functionality:

a) Players must be notified in advance of any operator-imposed limits and their effective dates. Once updated, operator-imposed limits must be consistent with what is disclosed to the player;

b) Upon receiving any operator-imposed limitation order, the operator must ensure that all specified limits are correctly implemented immediately or at the point in time (e.g., next login, next day) that was clearly indicated to the player; and

c) Operator-imposed limitations must not be compromised by internal status events, such as self-imposed exclusion orders and revocations.

6.3.4 ***Self-Imposed Exclusion.*** Players must be provided with an easy and obvious method to self-exclude from wagering for a specified period of time as defined in the terms and conditions, or indefinitely, as required by the regulatory body. The self-imposed exclusion method must provide the following functionality:

a) In the case of temporary self-imposed exclusion, the operator must ensure that the player is not prevented from withdrawing any or all of their account balance, provided that the operator acknowledges that the funds have cleared;

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b) In the case of indefinite self-imposed exclusion, the operator must ensure that the player is paid in full for their account balance, provided that the operator acknowledges that the funds have cleared;

c) Immediately upon receiving the self-imposed exclusion order, no new wagers or deposits are accepted from that player, until such time as the self-imposed exclusion has been removed; and

d) It is recommended that players be provided with a mechanism to request cancellation of the self-imposed exclusion order.

6.3.5 ***Operator-Imposed Exclusion.*** The operator must be capable of excluding a player from wagering according to the terms and conditions agreed to by the player upon registration, as required by the regulatory body. The operator-imposed exclusion method must provide the following functionality:

a) Players must be provided a notification containing operator-imposed exclusion status and general instructions for resolution;

b) Immediately upon receiving the operator-imposed exclusion order, no new wagers or deposits are accepted from that player, until such time as the operator-imposed exclusion has been revoked; and

c) During the operator-imposed exclusion period, the player must not be prevented from withdrawing any or all of their account balance, provided that the operator acknowledges that the funds have cleared, and that the reason(s) for exclusion would not prohibit a withdraw.

6.3.6 ***Disputes.*** The operator must provide an easy and obvious method for a player to make a complaint, and to enable the player to notify the regulatory body if such complaint has not been or cannot be addressed by the operator, or under other circumstances as specified by the law of the regulatory body.

a) Contact information for complaints and dispute resolution must be readily accessible to the player.

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b) Players must be able to log complaints and disputes on a 24/7 basis.

c) Records of all correspondence relating to a complaint and dispute shall be maintained for a period of five years or as otherwise specified by the regulatory body.

d) It is recommended that a privately documented process exist between the operator and the regulatory body on the dispute reporting and resolution process.

6.3.7 ***Inactive Accounts.*** A player account is considered to be inactive under the conditions as specified in the terms and conditions for the Event Wagering System.

a) Operators must employ a method to protect inactive player accounts that contain funds from unauthorized access, changes or removal.

b) It is recommended that a privately documented process be put in place to deal with unclaimed funds from inactive accounts.

6.3.8 ***Player Funds Maintenance.*** The following requirements apply to the maintenance of funds associated with a player account:

a) All financial transactions must be conducted in accordance with local commerce regulations and standards observed by the regulatory body.

b) 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 wagering until such time as the funds are received from the issuer or the issuer provides an authorization number indicating that the funds are authorized. The authorization number is to be maintained in an audit log.

c) Positive player identification, including any PIN entry or other approved secure methods, must be completed before the withdrawal of any funds held by the operator can be made.

d) A player's request for withdrawal of funds (i.e., deposited and cleared funds and wagers won) must be completed by the operator within a reasonable amount of time, unless there is a pending unresolved player dispute or investigation. Such investigation must be documented by the operator and available for review by the regulatory body.

e) Payments from an account are to be paid (including funds transfer) directly to an account

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with a financial institution in the name of the player or made payable to the player and forwarded to the player's address or through another method that is not prohibited by the regulatory body. The name and address are to be the name as held in player registration details.

f) An operator must have in place security or authorization procedures to ensure that only authorized adjustments can be made to player accounts, and these changes are auditable.

g) It shall not be possible to transfer funds between two player accounts.

6.3.9 ***Transaction Log or Account Statement.*** The operator must be able to provide a transaction log or account statement history to players upon request. The information provided must include sufficient information to allow the player to reconcile the statement or log against their own financial records. Information to be provided must include at a minimum, details on the following types of transactions:

a) Financial Transactions (time stamped):
   - i. Deposits to the player account;
   - ii. Withdrawals from the player account;
   - iii. Promotional or bonus credits added to/removed from the player account (outside of credits won in wagering);
   - iv. Manual adjustments or modifications to the player account (e.g., due to refunds)

b) Wagering Transactions:
   - i. The date and time the wager was placed;
   - ii. The date and time the event started and ended or is expected to occur for future events (if known);
   - iii. The date and time the results were confirmed (blank until confirmed);
   - iv. Any player choices involved in the wager, including wager selection, type of wager and attributes, and any special condition(s) applying to the wager;
   - v. The results of the wager (blank until confirmed);
   - vi. Total amount wagered, including any promotional/bonus credits (if applicable);
   - vii. Total amount won, including any promotional/bonus credits (if applicable);
   - viii. Commission or fees collected (if applicable); and

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ix. The date and time the winning wager was paid to the player.

6.4 Player Loyalty Programs

6.4.1 ***General Statement.*** Player loyalty programs are any programs that provide incentives for players based on the volume of play or revenue received from a player.

6.4.2 ***Player Loyalty Programs.*** If player loyalty programs are supported by the Event Wagering System, the following principles must apply:

a) Use of player loyalty data must not breach the privacy policy;
b) All awards must be equally available to all players who achieve the defined level of qualification for player loyalty points;
c) Redemption of player loyalty points earned must be a secure transaction that automatically debits the points balance for the value of the prize redeemed;
d) All player loyalty database transactions are to be recorded by the Event Wagering System; and
e) If the player loyalty program is provided by an third party service provider the Event Wagering System must be capable of securely communicating with that service.

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Diogenes
Exhibit 2008 - Page 051

CHAPTER 7: SYSTEM AND OPERATOR REQUIREMENTS

7.1 Introduction

7.1.1 ***Introduction.*** The Event Wagering System's server(s) may be located locally, within a single venue or may be remotely located outside of the venue as allowed by the regulatory body. If the Event Wagering System is comprised of multiple computer systems at various sites, the Event Wagering System as a whole and all communication between its components must conform to the applicable technical requirements within this document.

7.2 System Clock Requirements

7.2.1 ***System Clock.*** The Event Wagering System must maintain an internal clock that reflects the current date and time that shall be used to provide for the following:

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

7.2.2 ***Time Synchronization.*** The Event Wagering System must be equipped with a mechanism to ensure the time and dates between all components that comprise the Event Wagering System are synchronized.

7.3 Control Program

7.3.1 ***Control Program Self-Verification.*** Operators must be capable of verifying that all control program components contained on the Event Wagering System are authentic copies of approved components of the Event Wagering System, upon installation, at least once every 24 hours, and on demand using a method approved by the regulatory body:

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Exhibit 2008 - Page 052

a) The authentication mechanism must employ a hash algorithm which produces a message digest of at least 128 bits.

b) A system log or report must be retained and be accessible for a period of 90 days or as otherwise specified by the regulatory body, which details the verification results for each control component authentication.

c) The control program authentication must include all control program components which may affect regulated wagering operations. Control program components include, but are not limited to, executables, libraries, wagering or system configurations, operating system files, components that control required system reporting, and database elements that affect system operations.

d) Event Wagering Systems shall also provide a mechanism such that if any control program component is determined to be invalid, a notification of the authentication failure will be immediately communicated to the operator and regulatory body as required.

e) This mechanism must also require that an administrator of the Event Wagering System confirm any failed authentication with the system within 72 hours or as otherwise specified by the regulatory body. Failure to confirm a failed authentication must require the Event Wagering System to automatically stop any wagering functions related to that control program component.

7.3.2 ***Control Program Independent Verification.*** Each control program component of the Event Wagering System must have a method to be verified via an independent third-party verification procedure. The third-party verification process shall operate independently of any process or security software within the Event Wagering System. The independent test laboratory, prior to system approval, shall approve the integrity check method.

7.4 Shutdown and Recovery

7.4.1 ***Shutdown and Recovery.*** The following shutdown and recovery capabilities must be available:

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Exhibit 2008 - Page 053

a) The Event Wagering System must be able to perform a graceful shut down, 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 control program components of the Event Wagering System have been authenticated using an approved method (e.g., CRC, MD5, SHA-1); and
   iii. Communication with all components necessary for Event Wagering System operation have been established and similarly authenticated.

b) The operator must be able to identify and properly handle the situation where a master reset has occurred on any component which affects regulated wagering operations.

c) In the event of a catastrophic failure when the Event Wagering System cannot be restarted in any other way, it shall be possible to restore the system from the last backup point and fully recover. The contents of that backup must contain the following critical information including, but not limited to:
   i. The recorded information specified under the section entitled "Information to be Retained";
   ii. Specific venue information such as configuration, security accounts, etc.;
   iii. Current system encryption keys; and
   iv. Any other system parameters, modifications, reconfiguration (including participating venues), additions, merges, deletions, adjustments and parameter changes.

d) When two or more components are linked, the process of all wagering activities between the two components must not be adversely affected by restart/recovery of either component (e.g., wagering transactions are not to be lost or duplicated because of recovery of one component or the other). Upon restart or recovery, the components must immediately synchronize the current status of all transactions, data, and configurations with one another.

e) The operator must include a method to void wagers and pays in the event of a malfunction of the Event Wagering System itself if a full recovery is not possible.

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7.5 Wagering Control

7.5.1 ***Wagering Control.*** The Event Wagering System must be able to suspend the following on demand:

a) All event wagering;
b) Individual events;
c) Individual markets;
d) Individual Wagering Devices (if applicable); and
e) Individual player logins (if applicable).

7.5.2 ***Suspension Logging.*** When wagering is suspended for an active event an entry must be made in an audit log that includes the reason.

7.6 Information to be Maintained

7.6.1 ***Data Retention and Time Stamping***. The operator must be capable of retaining and backing up all recorded information, within this section, for a period of five years or as otherwise specified by the regulatory body.

a) The Event Wagering System clock must be used for all time stamping.
b) Event Wagering Systems must provide a mechanism to export the data for the purposes of data analysis and auditing/verification (e.g., CSV, XLS).

7.6.2 ***Wager Record Information***. For each individual wager placed by the player, the information to be maintained and backed up by the Event Wagering System must include:

a) The date and time the wager was placed;
b) Any player choices involved in the wager:
    i. Wager selection (e.g., athlete or team name and number);

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ii. Type of wager and line postings (e.g., money line bet, point spreads, over/under amounts, win/place/show);

iii. Any special condition(s) applying to the wager;

c) The results of the wager (blank until confirmed);

d) Total amount wagered, including any promotional/bonus credits (if applicable);

e) Total amount won, including any promotional/bonus credits (if applicable);

f) Commission or fees collected (if applicable);

g) The date and time the winning wager was paid to the player;

h) Unique identification number of the wager record;

i) Attendant identification handling the wager, if assisting the player;

j) Relevant geolocation information (if applicable);

k) Event and market identifiers;

l) Current wager status (active, cancelled, etc.);

m) Unique player ID, for wagers conducted using a player account;

n) For wagers conducted using a venue-controlled Wagering Device:

i. Unique Wagering Device ID;

ii. Status of wager record (valid, unredeemed, pending, void, invalid, redemption in progress, redeemed, etc.);

iii. Expiration period (if applicable); and

iv. Open text field for attendant input of player description or picture file;

7.6.3 ***Market Information***. For each individual market available for wagering, the information to be maintained and backed up by the Event Wagering System must include:

a) The date and time the wagering period started and ended;

b) The date and time the event started and ended or is expected to occur for future events (if known);

c) The date and time the results were confirmed (blank until confirmed);

d) Total amount of wagers collected, including any promotional/bonus credits (if applicable);

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e) The line postings that were available throughout the duration of a market (time stamped) and the confirmed result (win/loss/push);

f) Total amount of winnings paid to players, including any promotional/bonus credits (if applicable);

g) Total amount for cancelled wagers, including any promotional/bonus credits (if applicable);

h) Commission or fees collected (if applicable);

i) Event status (in progress, complete, confirmed, etc.); and

j) Event and market identifiers.

7.6.4 ***Wagering Device Information.*** For each individual venue-controlled Wagering Device, the information to be maintained and backed up by the Event Wagering System must include:

a) Unique Wagering Device ID;

b) Winning wager record redemptions, if supported;

c) Wager record voids and adjustments;

d) Attendant identification and session information (if applicable);

e) Significant events, if supported:

   i. Any time a control program component is added, removed, or altered;

   ii. Changes made to settings/configurations (including a description of the changes);

   iii. Power resets;

   iv. Communication failures;

   v. Program verification errors or critical NV memory errors;

   vi. Door open errors and door close events; and

   vii. Peripheral device errors.

7.6.5 ***Player Account Information***. For Event Wagering Systems which support player account management, the information to be maintained and backed up by the Event Wagering System must include for each player account:

a) Unique player ID and player name;

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Diogenes
Exhibit 2008 - Page 057

b) Player credentials (including verification method);

c) Date of player agreement to the operator's Terms and Conditions and Privacy Policy;

d) Account details and current balance;

e) Open text field for attendant input of player description by attendant or picture file;

f) Previous accounts, if any, and reason for de-activation;

g) Date and method from which the account was registered (remote vs. on-site);

h) Exclusions/limitations information as required by the regulatory body:

   i. The date and time of the request (if applicable);

   ii. Description and reason of exclusion/limitation

   iii. Type of exclusion/restriction (e.g., operator-imposed exclusion, self-imposed limitation);

   iv. Date exclusion/limitation commenced;

   v. Date exclusion/limitation ended, if applicable;

i) Financial Transaction information:

   i. Type of transaction (e.g., deposit, withdrawal, adjustment);

   ii. The date and time of the transaction;

   iii. Unique transaction ID;

   iv. Amount of transaction;

   v. Total account balance before/after transaction;

   vi. Total amount of fees paid for transaction (if applicable);

   vii. Transaction status (pending, complete, etc.);

   viii. Method of deposit/withdrawal (e.g., cash, debit or credit card, personal check, cashier's check, wire transfer, money order);

   ix. Deposit authorization number;

   x. Unique Wagering Device ID that identifies where the transaction took place (if applicable);

   xi. Attendant identification handling the transaction, if assisting the player; and

   xii. Relevant geolocation information (if applicable).

7.6.6 ***<u>Significant Event Information</u>***. Significant event information to be maintained and backed up by the Event Wagering System must include:

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a) Failed login attempts;

b) Program error or authentication mismatch;

c) Firewall audit log full;

d) Remote access, where supported;

e) Significant periods of unavailability of any critical component of the Event Wagering System;

f) Large wins (single and aggregate over defined time period) in excess of a value specified by the regulatory body, including wager record information;

g) Large wagers (single and aggregate over defined time period) in excess of a value specified by the regulatory body, including wager record information;

h) System voids, overrides, and corrections;

i) Changes to live data files occurring outside of normal program and operating system execution;

j) Changes that are made to the download data library, including the addition, changing or deletion of software, where supported;

k) Changes to operating system, database, network, and application policies and parameters;

l) Changes to date/time on master time server;

m) Changes to previously established criteria for an event or market (not including line posting changes for active markets);

n) Player Account Management:

   i. Changes made to information recorded in a player account;

   ii. Irrecoverable loss of player-related data;

   iii. Deactivation of a player;

   iv. Large financial transactions (single and aggregate over defined time period) in excess of a value specified by the regulatory body, including transaction information;

o) Any other activity requiring employee intervention and occurring outside of the normal scope of system operation; and

p) Other significant or unusual events as deemed applicable by the regulatory body.

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7.7 Reporting

7.7.1 ***General Reporting Requirements*****.** The operator must be capable of generating reports as required by the regulatory body. In addition to meeting the requirements in the section above for "Data Retention and Time Stamping", the following requirements shall apply for required reports:

a) Required reports shall be available on demand and for intervals required by the regulatory body including, but not limited to, daily, month to date (MTD), year to date (YTD), and life to date (LTD).
b) Each required report must indicate the operator, the selected interval and the date/time the report was generated.
c) Required reports must be generated by the system, even if the period specified contains no data to be presented. The report generated shall indicate all required information and contain an indication of "No Activity" or similar message if no data appears for the period specified.

NOTE: *In addition to the reports outlined in this section, the regulatory body may also require other reports utilizing the information stored under the "Information to be Maintained" section of this document.*

7.7.2 ***Operator Revenue Report.*** The Event Wagering System must be able to provide an *Operator Revenue Report* (or similarly named report) which may be used for operator taxation information. The report must contain the following information at a minimum for each event as a whole and for each individual market within that event:

a) The date and time each event started and ended;
b) Total amount of wagers collected;
c) Total amount of winnings paid to players;
d) Total amount of wagers cancelled
e) Commission and fees collected;

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f) Event and market identifiers; and

g) Event status (in progress, complete, confirmed, etc.).

7.7.3 ***Operator Liability Report.*** The Event Wagering System must be able to provide an *Operator Liability Report* (or similarly named report). The report must contain the following information at a minimum:

a) Total amount held by the operator for the player accounts (if applicable);

b) Total amount of wagers placed on future events; and

c) Total amount of winnings owed but unpaid by the operator on winning wagers.

7.7.4 ***Promotion/Bonus Summary Report.*** The Event Wagering System must be able to provide a *Promotion/Bonus Summary Report* (or similarly named report) for any promotions and/or bonuses that are redeemable for cash, wagering credits, or merchandise. The report must contain the following information at a minimum for each promotion/bonus:

a) Beginning balance for promotion/bonus;

b) Total amount of promotions/bonuses issued;

c) Total amount of promotions/bonuses redeemed;

d) Total amount of promotions/bonuses expired;

e) Total amount of promotion/bonus adjustments; and

f) Ending balance for promotion/bonus.

7.7.5 ***Future Events Report.*** The Event Wagering System must be able to provide a Future Events Report (or similarly named report). The report must contain the following information at a minimum for the gaming day:

a) Wagers placed prior to the gaming day for future events (total and by wager);

b) Wagers placed on the gaming day for future events (total and by wager);

c) Wagers placed prior to the gaming day for events occurring on that same day (total and by wager);

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d) Wagers placed on the gaming day for events occurring on that same day (total and by wager);
e) Wagers cancelled on the gaming day (total and by wager); and
f) Event and market identifiers.

7.7.6 ***Contest/Tournament Report.*** Event Wagering Systems which support contests/tournaments must be able to provide a *Contest/Tournament Report* (or similarly named report) for each contest/tournament. The report must contain the following information at a minimum:

a) Name of the contest/tournament;
b) The date and time the contest/tournament occurred or will occur (if known);
c) Unique player ID and name of each registered player, amount of entry fee paid, and the date paid;
d) Unique player ID and name of each winning player, amount paid, and the date paid;
e) Total amount of entry fees collected, including any promotional/bonus credits (if applicable);
f) Total amount of winnings paid to players, including any promotional/bonus credits (if applicable);
g) Commission or fees collected (if applicable); and
h) Contest/tournament status (in progress, complete, etc.).

7.7.7 ***Significant Events and Alterations Report.*** The Event Wagering System must be able to provide a *Significant Events and Alterations Report* (or similarly named report). The report must contain the following information at a minimum for each significant event:

a) Date and time of each significant event or alteration;
b) Event/Component identifier (if applicable);
c) Identification of user(s) who performed and/or authorized the alteration;
d) Reason/description of the significant event or alteration, including data or parameter altered;

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e) Data or parameter value prior to alteration; and

f) Data or parameter value after alteration.

7.7.8 ***Player Account Balance Adjustment Report.*** Event Wagering Systems which support player account management must be able to provide a *Player Account Balance Adjustment Report* (or similarly named report). The report must contain the following information at a minimum:

a) Unique player ID and player name;

b) Date and time of account balance adjustment;

c) Unique transaction ID;

d) Identification of user(s) who performed and/or authorized the adjustment;

e) Amount of account balance adjustment;

f) Account balance prior to adjustment;

g) Account balance after adjustment;

h) Type of account balance adjustment; and

i) Reason/description of adjustment to account balance.

7.7.9 ***User Access Listing Report.*** The Event Wagering System must be able to provide a *User Access Listing Report* (or similarly named report), detailing the list of users and user access to the Event Wagering System. The report must contain the following information at a minimum:

a) Employee name and title or position;

b) User login name;

c) Full list and description of functions that each group/user account may execute;

d) Date and time account created;

e) Date and time of last login;

f) Date of last password change;

g) Date and time account disabled/deactivated; and

h) Group membership of user account (if applicable).

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Diogenes
Exhibit 2008 - Page 063

7.8 Taxation

7.8.1 ***Taxation Requirements.*** The Event Wagering System must support a mechanism that is capable of identifying all player wins that are subject to taxation (single wins or aggregate wins over defined time period as required) and providing the necessary information in accordance with each regulatory body's taxation requirements.

7.9 Operational Guidelines

7.9.1 ***General Statement.*** This section contains guidance relevant to the limitation of risks in wagering operations. The requirements which follow cover fundamental controls which are recommended to minimally be put in place. It is also recognized that additional controls which are not specifically included within this standard will be relevant and required as determined by the operator and/or regulatory body.

7.9.2 ***Risk Management.*** Operators should have processes in place for managing risk, as required by the regulatory body. This includes, but is not limited to:

a) Identifying and/or refusing to accept suspicious wagers which may indicate cheating, manipulation, interference with the regular conduct of an event, or violations of the integrity of any event on which wagers were made.
b) Reasonably detecting irregular patterns or series of wagers in order to prevent player collusion or the unauthorized use of artificial player software.
c) Preventing players from wagering on events in which they might have insider information, including, but not limited to the following examples:
    i. Employees, subcontractors, directors and officers of an operator may not place wagers on any event, except in private pools where their association with the operator is clearly disclosed.
    ii. Professional athletes, team employees, league officials, referees, umpires and sports agents may not place wagers on any event in the sport in which they participate, or in which the athlete they represent participates.

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d) Adopting Anti-Money Laundering (AML) procedures as required by the regulatory body.

7.9.3 ***Operator Reserves and Account Segregation.*** Operators should maintain adequate cash reserves, as determined by the regulatory body, including segregated accounts of funds held for player accounts and operational funds such as those used to cover unclaimed winning wagers and potential winning wagers for the gaming day.

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CHAPTER 8: SYSTEM SECURITY REQUIREMENTS

8.1 Introduction

8.1.1 ***Introduction.*** To ensure players are not exposed to unnecessary security risks by participating in wagering operations, these security requirements apply to the following critical components of the Event Wagering System:

a) Components which record, store, process, share, transmit or retrieve player credentials (e.g., authentication information, player account balances);
b) Components which generate, transmit, or process random numbers used to determine the outcome of virtual events (if applicable);
c) Components which store results or the current state of a player's wager;
d) Points of entry to and exit from the above components (other systems which are able to communicate directly with core critical systems); and
e) Communication networks which transmit player credentials.

8.2 System Operation & Security

8.2.1 ***Physical Security and Intrusion Protection.*** The Event Wagering System servers and components shall be located in secure areas and shall have sufficient physical/logical intrusion protection against unauthorized access. Any physical access to areas housing Event Wagering System servers and components, and any logical access to the Event Wagering System applications or operating system shall be recorded.

8.2.2 ***Logical Access Control.*** The Event Wagering System shall be logically secured through the use of passwords, biometrics, or other means. The storage of passwords, PINs, biometrics, and other authentication credentials (e.g., magnetic swipe, proximity cards, embedded chip cards) shall be secure. The Event Wagering System must have multiple security access levels to control and restrict different classes of access to the server.

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Diogenes
Exhibit 2008 - Page 066

8.2.3 ***Security from Alteration, Tampering, or Unauthorized Access.*** The Event Wagering System shall provide a logical means for securing the player and wagering data against alteration, tampering, or unauthorized access. The following rules also apply to the player and wagering data within the Event Wagering System:

a) No equipment shall have a mechanism whereby an error will cause the player and wagering data to automatically clear;
b) Data shall be maintained at all times regardless of whether the server is being supplied with power; and
c) Data shall be stored in such a way as to prevent the loss of the data when replacing parts or modules during normal maintenance.

8.2.4 ***Data Alteration.*** The Event Wagering System shall not permit the alteration of any accounting, reporting or significant event data without supervised access controls. In the event any data is changed, the following information shall be documented or logged:

a) Data element altered;
b) Data element value prior to alteration;
c) Data element value after alteration;
d) Time and date of alteration; and
e) Personnel that performed alteration (user login).

8.2.5 ***Server Programming.*** There shall be no means available for an operator to conduct programming on the Event Wagering System in any configuration (e.g.,
the operator shall not be able to perform SQL statements to modify the database). However, it is acceptable for Network Administrators to perform authorized network infrastructure maintenance with sufficient access rights, which would include the use of SQL statements that were already resident on the Event Wagering System.

8.2.6 ***Copy Protection.*** Copy protection to prevent unauthorized duplication or modification of

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Exhibit 2008 - Page 067

software may be implemented provided that:

a) The method of copy protection is fully documented and provided to the independent test laboratory, to verify that the protection works as described; or
b) The program or component involved in enforcing the copy protection can be individually verified by the methodology approved by the regulatory body.

8.3 Communication Requirements

8.3.1 ***General Statement.*** This section will discuss the various wired and wireless communication methods. The requirements of this section shall also apply if communications are performed across the internet or a public or third party network, as allowed by the regulatory body.

8.3.2 ***Communication Protocol.*** Each component of the Event Wagering System must function as indicated by a documented communication protocol. An Event Wagering System must provide for the following:

a) All protocols must use communication techniques that have proper error detection and recovery mechanisms, which are designed to prevent eavesdropping and tampering. Any alternative implementations will be reviewed on a case-by-case basis and approved by the regulatory body; and
b) All data communications critical to wagering or player account management shall employ encryption.

8.3.3 ***Connectivity.*** Only authorized devices shall be permitted to establish communications between any system components. Event Wagering Systems shall provide a method to:

a) Verify that the system component is being operated by an authorized user;
b) Enroll and un-enroll system components;
c) Enable and disable specific system components;

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d) Ensure that only enrolled and enabled system components participate in wagering operations; and

e) Ensure that the default condition for components shall be un-enrolled and disabled.

8.3.4 ***Communications over Public Networks*****.** Communications between any Event Wagering System components, including Wagering Devices, which takes place over internet/public networks, must be secure by a means approved by the regulatory body. Player credentials, sensitive information, wagers, results, financial information, and player transaction information must always be protected over the internet/public network.

8.3.5 ***WLAN Communications*****.** Wireless Local Area Network (WLAN) communications, as allowed by the regulatory body, shall adhere to the applicable jurisdictional requirements specified for wireless devices and network security. In the absence of specific jurisdictional standards, the "Wireless Device Requirements" and "Wireless Network Security Requirements" of *GLI-26 Wireless Systems* must be used as applicable.

NOTE: *It is imperative for organizations to review and update internal control policies and procedures to ensure the Event Wagering System is secure and threats and vulnerabilities are addressed accordingly. GLI recommends the use of a private independent IT security company to plan, inspect and verify the integrity of the WLAN.*

8.3.6 ***Third Party Communications*****.** Where communications with third party service providers are implemented, such as financial services (banks, payment facilities etc.), location services, statistics/line services, identity verification services, the following must apply:

a) Strong authentication must be used in connections between the system and third party service providers;

b) All login events involving third party service providers must be recorded to an audit file;

c) Third party service provider data must not affect player communications;

d) Wagering must be disabled on all network connections except for the player network;

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e) All financial transactions must be reconciled with financial institutions and payment agencies on a daily basis; and

f) Controls must be implemented to review the accuracy and timeliness of any statistics/line services. In the event that an incident or error occurs that results in a loss of communication with statistics/line services, such error shall be recorded in a log capturing the date and time of the error, the nature of the error and a description of its impact on the system's performance. Such information shall be maintained for a period of 90 days, or as otherwise specified by the regulatory body.

8.3.7 ***Network Security Management.*** Networks must be logically separated such that there should be no network traffic on a network link which cannot be serviced by hosts on that link.

a) The failure of any single item must not result in a denial of service.

b) An Intrusion Detection System/Intrusion Prevention System shall be installed on the network which can:
   i. Listen to both internal and external communications;
   ii. Detect or prevent Distributed Denial of Service (DDOS) attacks;
   iii. Detect or prevent shellcode from traversing the network;
   iv. Detect or prevent Address Resolution Protocol (ARP) spoofing; and
   v. Detect other Man-in-the-Middle indicators and sever communications immediately if detected;

c) In addition to the requirements in (b), an Intrusion Detection System/Intrusion Prevention System installed on a WLAN must be able to:
   i. Scan the network for any unauthorized or rogue wireless devices connected to any access point on the network;
   ii. Scan the network for any unauthorized or rogue access points;
   iii. Automatically disable any unauthorized or rogue wireless devices connected to the system; and
   iv. Maintain a history log of all wireless access for at least the previous 90 days or as otherwise specified by the regulatory body. This log must contain complete and comprehensive information about all wireless devices involved, and must be able

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Exhibit 2008 - Page 070

to be reconciled with all other networking devices within the venue or property.

d) In virtualized environments, redundant server instances cannot run under the same hypervisor.

e) Stateless protocols, such as UDP (User Datagram Protocol), must not be used for sensitive data without stateful transport. Note that although HTTP (Hypertext Transport Protocol) is technically stateless, if it runs on TCP (Transmission Control Protocol) which is stateful, this is allowed.

f) All changes to network infrastructure (e.g., network device configuration) shall be logged.

g) Virus scanners and/or detection programs must be installed on all systems. These programs must be updated regularly to scan for new strains of viruses.

h) Network and application security must be tested by a qualified and experienced individual on a regular basis as required by the regulatory body.

   i. Testing must include testing of the external (public) interfaces and the internal network; and

   ii. Testing of each security domain on the internal network must be undertaken separately.

8.4 Backup and Recovery

8.4.1 ***System Failure***. The Event Wagering System shall be designed to protect the integrity of pertinent data in the event of a failure. Audit logs, system databases, and any other pertinent data must be stored using reasonable protection methods. If hard disk drives are used as storage media, data integrity must be assured in the event of a disk failure. Acceptable methods include, but are not limited to, multiple hard drives in an acceptable RAID configuration, or mirroring data over two or more hard drives. The method used must also provide open support for backups and restoration. Backup scheme implementation must occur at least once every day or as otherwise specified by the regulatory body, although all methods will be reviewed on a case-by-case basis by the independent test laboratory.

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Exhibit 2008 - Page 071

8.4.2 ***Storage Medium Backup.*** The Event Wagering System shall have sufficient redundancy and modularity so that if any single component or part of a component fails, wagering operations can continue. Redundant copies of critical data shall be kept on the Event Wagering System with open support for backups and restoration:

a) All storage shall be contained on a nonvolatile physical medium, or an equivalent architectural implementation, so that should the primary storage medium fail, the functions of the Event Wagering System and the process of auditing those functions can continue with no critical data loss.
b) The database shall be stored on redundant media so that no single failure of any portion of the system would cause the loss or corruption of data.

8.4.3 ***UPS Support***. Where the server is a stand-alone application, it must have an Uninterruptible Power Supply (UPS) connected and must have sufficient capacity to permit a graceful shut-down and that retains all Event Wagering System data during a power loss. It is acceptable that the Event Wagering System may be a component of a network that is supported by a network-wide UPS provided that the server is included as a device protected by the UPS.

8.4.4 ***Business Continuity and Disaster Recovery.*** A business continuity and disaster recovery plan shall be in place to recover wagering operations in the event that the production system is rendered inoperable. The business continuity and disaster recovery plan shall:

a) Address the method of storing player account information and wagering data to minimize loss. If asynchronous replication is used, the method for recovering data must be described or the potential loss of data must be documented;
b) Delineate the circumstances under which it will be invoked;
c) Address the establishment of a recovery site physically separated from the production site;
d) Contain recovery guides detailing the technical steps required to re-establish wagering functionality at the recovery site; and

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e) Address the processes required to resume administrative operations of wagering activities after the activation of the recovered system for a range of scenarios appropriate for the operational context of the Event Wagering System.

8.5 Technical Controls

8.5.1 ***DNS Requirements.*** The following requirements apply to the primary server used to resolve Domain Name Service (DNS) queries used in association with the Event Wagering System:

a) The primary DNS server shall be physically located in a secure data center.
b) Logical and physical access to the primary DNS server shall be restricted to authorized personnel.
c) Zone transfers to arbitrary hosts shall be disallowed.
d) DNS Security Extensions (DNSSEC) must be in place.
e) Multi-factor authentication must be in place.
f) Registry lock must be in place, so any request to change a DNS will need to be verified manually.

8.5.2 ***Cryptographic Controls.*** A policy on the use of cryptographic controls for protection of information must be developed and implemented.

a) Any sensitive or personally identifiable information must be encrypted if it traverses a network with a lower level of trust.
b) Data that is not required to be hidden but shall be authenticated shall use some form of message authentication technique.
c) Authentication shall use a security certificate from an approved organization.
d) The grade of encryption used must be appropriate to the sensitivity of the data.
e) The use of encryption algorithms shall be reviewed periodically by qualified staff to verify that the current encryption algorithms are secure.
f) Changes to encryption algorithms to correct weaknesses shall be implemented as soon as

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practical. If no such changes are available, the algorithm shall be replaced.

g) Encryption keys shall not be stored without being encrypted themselves through a different encryption method and/or by using a different encryption key.

8.5.3 ***Encryption Key Management.*** The management of encryption keys shall follow defined processes established by the operator and/or regulatory body. These defined processes shall cover the following:

a) Obtaining or generating encryption keys and storing them;
b) Managing the expiry of encryption keys, where applicable;
c) Revoking encryption keys;
d) Securely changing the current encryption keyset; and
e) Recovering data encrypted with a revoked or expired encryption key for a defined period of time after the encryption key becomes invalid.

8.6 Remote Access and Firewalls

8.6.1 ***Remote Access.*** Remote access is defined as any access from outside the system or system network including any access from other networks within the same establishment. Remote access shall only be allowed if authorized by the regulatory body and shall have the option to be disabled. Where allowed, remote access shall accept only the remote connections permissible by the firewall application and Event Wagering System settings. Remote access security will be reviewed on a case-by-case basis, in conjunction with the implementation of the current technology and approval from the regulatory body. In addition, there shall be:

a) No unauthorized remote user administration functionality (adding users, changing permissions, etc.);
b) No unauthorized access to any database other than information retrieval using existing functions; and
c) No unauthorized access to the operating system.

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NOTE: *GLI acknowledges that the system manufacturer may, as needed, remotely access the Event Wagering System and its associated components for the purpose of product and user support, as permitted.*

8.6.2 ***Remote Access Activity Log***. The Event Wagering System must maintain an activity log which updates automatically depicting all remote access information, to include:

a) Log in name;
b) Remote IP Addresses, Port Numbers, Protocols, and where possible, MAC Addresses;
c) Time and date the connection was made;
d) Duration of connection; and
e) Activity while logged in, including the specific areas accessed and changes made.

8.6.3 ***Firewalls*****.** All communications, including remote access, must pass through at least one approved application-level firewall and must not have a facility that allows for an alternate network path. Any alternate network path existing for redundancy purposes must also pass through at least one application-level firewall. In addition, the firewall shall:

a) Be located at the boundary of any two dissimilar security domains;
b) Be a separate hardware device with the following characteristics:
    i. Only firewall-related applications may reside on the firewall;
    ii. Only a limited number of accounts may be present on the firewall (e.g., system administrators only).
c) Reject all connections except those that have been specifically approved;
d) Reject all connections from destinations which cannot reside on the network from which the message originated (e.g., RFC1918 addresses on the public side of an internet firewall); and
e) Only allow remote administration over the most up to date encrypted protocols.

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8.6.4 ***Firewall Audit Logs*****.** The firewall application must maintain an audit log and must disable all communications and generate a significant event if the audit log becomes full. The audit log shall contain:

a) All changes to configuration of the firewall;
b) All successful and unsuccessful connection attempts through the firewall; and
c) The source and destination IP Addresses, Port Numbers, Protocols, and where possible, MAC Addresses.

NOTE: *A configurable parameter 'unsuccessful connection attempts' may be utilized to deny further connection requests should the predefined threshold be exceeded. The system administrator must also be notified.*

8.7 Change Management

8.7.1 ***General Statement*****.** A change management policy is selected by the regulatory body for handling updates to the Event Wagering System based on the propensity for frequent system upgrades and chosen risk tolerance. For systems that require frequent updates, a risk-based change management program may be utilized to afford greater efficiency in deploying updates. Risk-based change management programs typically include a categorization of proposed changes based on regulatory impact and define associated certification procedures for each category. The independent test laboratory will evaluate the system and future modifications in accordance with the change management policy selected by the regulatory body.

8.7.2 ***Program Change Control Procedures.*** Program change control procedures shall be adequate to ensure that only authorized versions of programs are implemented on the production Event Wagering System. These change controls shall include:

a) An appropriate software version control or mechanism for all software components;
b) Details of the reason for the change;
c) Details of the person making the change;

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d) Complete backups of previous versions of software;

e) A policy addressing emergency change procedures;

f) Procedures for testing and migration of changes;

g) Segregation of duties between the developers, quality assurance team, the migration team and users; and

h) Procedures to ensure that technical and user documentation is updated as a result of a change.

8.7.3 ***Software Development Life Cycle.*** The acquisition and development of new software shall follow defined processes established by the operator and/or regulatory body.

a) The production environment shall be logically and physically separated from the development and test environments;

b) Development staff shall be precluded from having access to promote code changes into the production environment;

c) There shall be a documented method to verify that test software is not deployed to the production environment;

d) To prevent leakage of personally identifiable information, there shall be a documented method to ensure that raw production data is not used in testing; and

e) All documentation relating to software and application development must be available and retained for the duration of its lifecycle.

8.7.4 ***Patches.*** All patches should be tested whenever possible on an Event Wagering System configured identically to the target Event Wagering System. Under circumstances where patch testing cannot be thoroughly conducted in time to meet the timelines for the severity level of the alert and if authorized by the regulatory body, then patch testing should be risk managed, either by isolating or removing the untested Event Wagering System from the network or applying the patch and testing after the fact.

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Diogenes
Exhibit 2008 - Page 077

GLOSSARY OF KEY TERMS

Barcode – An optical machine-readable representation of data. An example is a barcode found on printed vouchers.

Barcode Reader – A device that is capable of reading or interpreting a barcode. It may extend to some smart phones or other electronic devices that can execute an application to read a barcode.

Bill Validator – A peripheral component used on a Self-Service Wagering Device that is capable of accepting paper currency, vouchers, and other approved notes in exchange for funds available for wagering. A bill validator may also be used in the redemption of printed wagering records.

Bluetooth – A low power, short-range wireless communications protocol utilized for the interconnection of cellular phones, computers, and other electronic devices, including Wagering Devices. Bluetooth connections typically operate over distances of 10 meters or less and rely upon short-wavelength radio waves to transmit data over the air.

Commission – An amount retained and not distributed by the operator from the total amount wagered on an event.

CRC, *Cyclic Redundancy Check* – A software algorithm used to verify the accuracy of data during its transmission, storage, or retrieval. The algorithm is used to validate or check the data for possible corruption or unauthorized changes.

Card Reader – A Wagering Device peripheral that reads data embedded on a magnetic strip, or stored in an integrated circuit chip, for the purpose of player identification.

Client Software – The software installed on a Remote Wagering Device that facilitates communication between the user interfaces and the Event Wagering System. Examples of Client Software include proprietary download software packages, html, flash, etc.

Coin Acceptor – A Self-Service Wagering Device peripheral that accepts coins or tokens in exchange for funds available for wagering. The coin-in assembly receives, verifies, counts and appropriately routes coins deposited into the device.

Combination Bet – aka Parlay – A single bet that links together two or more individual wagers and is dependent on all of those wagers winning together.

Control Program – A software program that controls Wagering Device behaviors relative to any applicable technical standard and/or regulatory requirement.

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

Critical Non-Volatile (NV) Memory – Memory used to store all data that is considered vital to the continued operation of the Wagering Device including, but not limited to, Wagering Device configuration data and state of operations

Cryptographic RNG – A Random Number Generator (RNG) which is resistant to attack or compromise by an intelligent attacker with modern computational resources who has knowledge of the source code of the RNG and/or its algorithm. Cryptographic RNGs cannot be feasibly 'broken' to predict future values.

Dividend – The amount corresponding to the winner of a pari-mutuel bet.

DNS, *Domain Name Service* – The globally distributed internet database which (amongst other things) maps machine names to IP numbers and vice-versa.

Drop Box – A secure container housed within a Self-Service Wagering Device cabinet that collects coins when the hopper is full or when the diverter directs coins to it.

EMC, *Electromagnetic Compatibility* – The principle by which any electronic or electrical appliance should be able to operate without causing, or being affected by, electromagnetic interference.

EMI, *Electromagnetic Interference* – Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment.

ESD, *Electro-Static Discharge* – The release of static electricity when two objects come into contact. It is the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or a dielectric breakdown.

Event – Occurrence related to sports, competitions, matches, and other types of activities approved by the regulatory body on which wagers may be placed.

Event Wagering – The wagering on sports, competitions, matches, and other event types approved by the regulatory body where the player places wagers on markets within an event.

Event Wagering System – The hardware, software, firmware, communications technology, other equipment, as well as operator procedures implemented in order to allow player participation in wagering, and, if supported, the corresponding equipment related to the display of the wager outcomes, and other similar information necessary to facilitate player participation. The system provides the player with the means to place and manage wagers. The system provides the operator with the means to review player accounts, if supported, suspend events, generate various wagering/financial transaction and account reports, input outcomes for events,

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and set any configurable parameters. The term does not include computer equipment or communications technology used by a player to access the Event Wagering System.

Firewall – A component of a computer system or network that is designed to block unauthorized access or traffic while still permitting outward communication.

Fixed Odds Wagers – Wager types where the payout is to be fixed at the time the wager is placed. If the predictions are correct, the odds are first multiplied by each other and then by the amount of the wager.

Free Play Mode – A mode that allows a player to participate in wagering without placing any financial wager, principally for the purpose of learning or understanding wagering mechanics.

Hash Algorithm – A function that converts a data string into a alpha-numeric string output of fixed length.

Hopper – An electromechanical assembly inside a device that receives, holds and dispenses coins. When the hopper is full, coins are diverted to the drop box.

In-Play Wager – A wager that is placed while an event is in-progress or actually taking place.

Jumper – A removable connector (e,g,, plug, wire, etc.) that electrically joins together or short-circuits two separate physical connections.

Line Posting – A value that establishes a wager's potential payout (e.g., money line + 175) or the conditions for a wager to be considered a win or loss (e.g., point spread + 2.5).

Market – A wager type (e.g., money line, spread, over/under) on which opportunities are built for wagering on one or more events.

MI, *Magnetic Interference* – Any magnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment.

Multi-Factor Authentication – A type of authentication which uses two or more of the following to verify a user's identity: Information known only to the user (e.g., a password, pattern or answers to challenge questions); An item possessed by a user (e.g., an electronic token, physical token or an identification card); A user's biometric data (e.g., fingerprints, facial or voice recognition).

Operator – A person or entity that operates an Event Wagering System, using both the technological capabilities of the Event Wagering System as well as their own internal procedures.

Pari-Mutuel Wagers – Wager types where individual wagers are gathered into a pool. The winnings are calculated by sharing the pool among all winning bets.

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Participant – The athlete, team, or other entity that competes in an event.

Past-Post Wager – A wager that was made after the result of an event is accepted or after the selected participant has gained a material advantage (e.g., a score).

PCB, *Printed Circuit Board* – A hardware component of a computer or other electronic device, consisting of a flat piece of a non-conductive, rigid material to which Integrated Circuits (ICs) and other electronic components such as capacitors, resistors, etc. are mounted. Electrical connections are made between the ICs and components using a copper sheet that is laminated into the overall board assembly.

Perfecta – aka Exacta – A bet in which the bettor picks the first and second place finishers in a competition in the correct order.

Peripheral – An internal or external device connected to a Wagering Device that supports credit acceptance, credit issuance, player interaction, wager record issuance/redemption, or other specialized function(s).

Physics Engine – Specialized software that approximates the laws of physics, including behaviors such as motion, gravity, speed, acceleration, mass, etc. for a virtual event's elements or objects. The physics engine is utilized to place virtual event elements/objects into the context of the physical world when rendering computer graphics or video simulations.

PIN, *Personal Identification Number* – A numerical code associated with an individual and which allows secure access to a domain, account, network, system, etc.

Player Credentials – Sensitive information regarding a player and which may include items such as full name, date of birth, place of birth, social security number, address, phone number, medical or employment history, or other personal information as defined by the regulatory body.

Player Identification Component – A player identification component is an electronic device which provides a means for players to enter their secure identification information. Examples include a card reader, a barcode reader, or a biometric scanner.

Player Loyalty Program – A program that provides incentives for players based on the volume of play or revenue received from a player.

Point-of-Sale Wagering Device – A venue-controlled attendant station that at a minimum will be used by an attendant for the execution or formalization of wagers placed on behalf of a player.

Printer – A Wagering Device peripheral that prints wager records, coupons, vouchers, or receipts.

Protocol – A set of rules and conventions that specifies information exchange between devices, through a network or other media.

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Quinella – A bet in which the first two places in a competition must be predicted, but not necessarily in the finishing order.

Remote Wagering Device – A device operated either on an in-venue wireless network or over the internet that converts communications from the Event Wagering System into a human interpretable form, and converts human decisions into communication format understood by the Event Wagering System. Examples of a Remote Wagering Device include a personal computer, mobile phone, tablet, etc.

RFI, *Radio Frequency Interference* – Electromagnetic radiation which is emitted by electrical circuits carrying rapidly changing signals, as a by-product of their normal operation, and which causes unwanted signals (interference or noise) to be induced in other circuits.

RNG, *Random Number Generator* – A computational or physical device, algorithm, or system designed to produce numbers in a manner indistinguishable from random selection.

Secure Areas or Secure Compartments – Sensitive areas of a Self-Service Wagering Device which are located behind an external door and within a cash compartment, peripheral device access area, or other areas of the device which allow access to components which could impact integrity.

Self-Service Wagering Device – A venue-controlled, player-facing device that at a minimum will be used for the execution or formalization of wagers placed by a player directly and, if supported will be used for redemption of winning wager records.

Sensitive Information – Includes information such as validation numbers, PINs, player credentials, passwords, secure seeds and keys, and other data that must be handled in a secure manner.

Stacker – An electromechanical bill validator component that loads bill, notes, coupons, or vouchers into a locked container for secure storage within the Self-Service Wagering Device.

Time stamp – A record of the current value of the Event Wagering System date and time which is added to a message at the time the message is created.

Totalisator – A scheme of pari-mutuel wagering, whether conducted by means of an instrument or contrivance known as a totalisator or otherwise, and the computerized system which runs pari-mutuel wagering, calculating payoff odds, displaying them, and producing records based on incoming bets.

Touch Screen – A video display device that also acts as a user input device by using electrical touch point locations on the display screen.

Trifecta – A bet in which a bettor wins by selecting the first three finishers of a competition in the correct order of finish.

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User Interface – An application or program through which the user views and/or interacts with the Wagering Device software to communicate their actions to the Event Wagering System.

Version Control – The method by which an evolving approved Event Wagering System is verified to be operating in an approved state.

Virtual Event Wagering – A form of betting that allows for the placement of wagers on sports, contests, and matches whose results are determined solely by an approved Random Number Generator (RNG).

Virtual Participant – The athlete or other entity that competes in a virtual event.

Voucher – A printed or virtual ticket issued by a Wagering Device which can be redeemed for cash or used to subsequently establish credits on a device. A virtual voucher is an electronic token exchanged between a player's mobile device and the Self-Service Wagering Device which is used for credit insertion and redemption.

Wager – Any commitment of credits or money by the player on the results of events.

Wager Record – A printed ticket or electronic message confirming the acceptance of one or more wagers.

Wagering Device – An electronic device that at a minimum will be used for the execution or formalization of wagers placed by a player directly or on behalf of a player by an attendant and, if supported, may be used for redemption of winning wager records. The term “venue-controlled Wagering Devices” refers to Self-Service Wagering Devices and Point-of-Sale Wagering Devices.

Wagering Rules and Information – The rules and information for each wager type for each type of wagering activity.

Wi-Fi – The standard wireless local area network (WLAN) technology for connecting computers and electronic devices to each other and/or to the internet.

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