

GLI
COMPOSITE
SUBMISSION REQUIREMENTS DOCUMENT

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About This Document

This document has been produced by **Gaming Laboratories International, LLC (GLI)** for the purpose of specifying the type of documentation and materials that may be required to be supplied by a submitting party making a submission of Gaming Equipment, Software, Systems, and/or element(s) thereof to GLI for the purpose of evaluation.

The intention of this document is not to limit or impede a submitting party in their capacity to make submissions to GLI, but merely to suggest manageable parameters surrounding compliance submissions. These guidelines form a basis for positive business and technical practices and represent significant areas of interest to submitting parties and regulatory bodies.

Please note that this document does not speak towards a particular jurisdiction's submission requirements for testing and therefore additional documentation and materials may be required by GLI for testing for that jurisdiction based on their adopted technical requirements.



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Chapter 1: Requirements for All Submissions

1.1 Introduction

1.1.1 General Statement

This document shall govern the types of information that are required to be submitted by a submitting party in order to have equipment tested by GLI. Where the information has not been submitted, or is not otherwise in the possession of GLI, the submitting party shall be asked to supply additional information. Failure to supply the information can result in denial of the submission and/or lead to testing delays.

1.1.2 Previous Submission

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

Should the updated submission contain new functionality and/or modified functionality such that the initially provided documentation is no longer accurate, updated versions of the impacted materials shall be provided.

1.2 General Requirements

1.2.1 Presentation of Identical Equipment To GLI

Each item that is submitted and will be certified by GLI is required to be functionally identical to the that which will be supplied to the field for use. For example, a gaming device supplied as a certified device shall not have different internal wiring, components, firmware, circuit boards, circuit board track cuts or circuit board patch wires from the certified specimen, unless that change is also certified.

NOTE: This shall not apply to wiring changes or component level changes, where wiring and components that are substituted, equate exactly to the previous approved configuration.

For submission that require consumable materials such as preprinted raffle tickets, decks of cards, bingo cards, or blank ticket stock, such consumables must be supplied to GLI for use.

1.2.2 Joint Venture Submissions

Gaming Equipment is considered to be a joint venture when two or more companies are involved in the manufacturing of one platform. Due to the increasing amount of joint venture submissions, and to alleviate any confusion to the suppliers and regulator clients, GLI has set forth the following procedures:

- a) One company will prepare and submit the entire submission, even if they are using parts from other suppliers, and must identify the part numbers of all components. This company will be the primary contact for the submission.
- b) All involved suppliers in a joint venture submission must be part of a multi-party agreement.
- c) The company submitting an approval request should do so on their letterhead. GLI will delegate an internal file number in this company's name and will bill this company for all costs incurred throughout the testing and approval process.
- d) The primary contact will be called when questions arise. However, GLI engineers will work with all parties involved in order to complete the review.
- e) All suppliers who are part of the submission "group" may need to be licensed in the jurisdiction(s) where the submission is being approved. As a courtesy to the supplier, GLI may inquire as to whom does not need to be licensed from the regulator client. It should be noted that licensing questions should be handled directly with the jurisdiction.
- f) Upon completion, the primary contact company will receive the approval letter, provided the submission meets the jurisdictional requirements. The primary contact company may then release copies of the approval letter to any associated manufacturer(s).

1.2.3 Submission Letter Requirements

Each submission shall include a request letter, on company letterhead, dated within one (1) week of the date the submission is received by GLI. The letter should include the following:

- a) The jurisdiction(s) for which you are requesting certification;
- b) The items requested for certification.
- c) In the case of software, the submitting party shall include ID numbers and revision levels, if applicable.
- d) In the case of proprietary hardware, the submitting party shall indicate the manufacturer, model, and part and revision numbers of the associated components of hardware. If the hardware has undergone any electrical and/or safety certification, such as Underwriter's Laboratory (UL) or equivalent, the submitting party shall provide documentation for same; and
- e) A contact person who will serve as the main point of contact for engineering questions raised during the evaluation of the submission. This may be either the person who signed the letter or another specified contact.

Submissions received in alternate formats will only be acceptable if previously discussed and agreed to by GLI.

1.2.4 Compatibility Environment Documentation

The following accompanying documentation is required for all submissions:

- a) Manufacturer documentation indicating support of any hardware, software, and peripheral equipment that may be used in the field in conjunction with the current submission.
- b) The components listed must include an ID number and revision level. If multiple revision levels are supported, it is sufficient to reference this information (i.e. program versions 1.7 and greater are supported).

1.2.5 Additional Submission Documentation

Please note that GLI has the right to request additional information or documentation from the submitter on a per submission basis (including transfers). This information will be used to validate the support and compliance of these components for the jurisdictions requested in the current submission request.

Additionally, certain submission types may require the submission of additional information such as username and password pairs used to access online archives or systems, FTP server addresses, credentials where digital submissions can be obtained, or remote server addresses required for component configurations. All such information should be provided at the time of submission via a secure channel agreed upon by all parties.

1.3 Submissions of Prototypes (Full Submissions)

1.3.1 General Statement

A Prototype (full submission) is a first-time submission of a particular piece of hardware or software that has not previously been reviewed by GLI. For modifications of previous submissions, including required changes to a previously submitted Prototype certification, whether certified or pending certification, see section “Submissions of Modifications (Partial Submissions)” of this document.

1.3.2 Software Submissions

Each submission of new software to be tested and certified shall contain the following:

- a) Two sets of all physical program storage devices necessary to install and test the submission. This includes all video, sound, printer, touchscreen, bill validator, NV memory clear, and gaming software;
- b) Digital copies of all submitted software that can be used to program the devices required above, unless already provided resident on the submitted media;
- c) All Source Code and the associated Link Maps, Symbol Tables or equivalent architectural documentation for the submitted software;
- d) If the functionality is contained within the submitted software, documentation of the Non-Volatile (NV) memory and/or program storage device authentication schema;
- e) Indication of if the software submission utilizes the same math model as a prior submission (Math Clone);
- f) Any and all additional software tools necessary to perform testing; and
- g) Documentation listing the official software signatures of all software provided (to be used to ensure the received image files and/or media contain the correct software).
- h) Additional copies of media and specific labels as required by the set of jurisdictions that are being requested may be required.

1.3.3 Hardware Submissions

All accompanying diagrams, technical documents, manuals and schematics shall be submitted. In addition, the following items shall be provided:

- a) If applicable, all UL, CSA, EC, AS3100, etc. or equivalent certifications. This certification information may be supplied at a later date if unavailable at the time of submission. i.e. when the testing is being performed in parallel with GLI testing;
- b) Any other equipment that may be used in the field in conjunction with the submission, such as printer and/or bill acceptor download kits and the procedures needed to use them;
- c) Accompanying software, see also the “Software Submissions” section above; and
- d) If the submitting party has specialized equipment which is needed by GLI to test the submitted device, then the specialized equipment and all appropriate operation manuals for the equipment shall be included with the submission.

1.3.4 Machine Submissions

In addition to the previous sections, player facing Gaming Equipment such as gaming devices and kiosks shall require the following, as applicable:

- a) If requested, extension cables for door photo-optic detectors and any other hardware should be provided, so that the machine may be tested with doors open.
- b) Where a processor board is oriented in a machine in such a way that it would be difficult to install a plug and/or cable for an emulator, extension cables should be provided to allow the board to be accessed or relocated. The use of such extension cables shall not adversely affect the machine's operation.
- c) A non-removable ID tag containing the information necessary for compliance with the regulations of the jurisdictions being requested.

1.4 Submissions of Modifications (Partial Submissions)

1.4.1 General Statement

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

1.4.2 Modification to Existing or Create New Software Functionality

The submitter should use the same requirements as in the “Software Requirements” section, except where the documentation has not changed. In this case, a resubmission of identical documents is not required. (e.g., for a game program, if the payable and mathematics are not changed, the submitting party may refer to previous documentation). However, the submission must include

- a) Identification of the previously submitted software version;
- b) A description of the software change(s), including any required change management classifications. Modifications should be written in layman's terms with their associated test case scenarios;
- c) The modules affected; and
- d) The new source code for the entire program to allow for its verification.

1.4.3 Modification to Existing Hardware

Each modified hardware submission shall:

- a) Identify the previously submitted hardware version;
- b) Explain what component it is modifying and how it was modified;
- c) Supply a complete set of schematics, diagrams, data sheets, etc. describing the modification along with the reason for the change(s);
- d) Provide the updated or new equipment, a description and the method of connection to the original Gaming Equipment or hardware; and
- e) Should the modifications require changes to test equipment necessary for the platform, i.e. emulation boards, external connections, etc., then the updated versions of that equipment must be provided.

1.5 Software Programming Requirements and Compilation

1.5.1 General Statement

The following items should appear in all submitted source code and related modules:

- a) Module Name;
- b) Brief description of module function; and
- c) Edit History, including who modified it, when and why.

NOTE: The source code may be reviewed, compiled and studied, either at the laboratory or at the supplier's place of business, as determined by GLI. The lack of sufficient documentation and comments increases the time necessary to perform the source code review.

1.5.2 Source Code Commented

All source code submitted should be commented in an informative and useful manner, allowing a reader without an in depth knowledge of the platform architecture to understand the nature of the functions and or code sections being examined.

1.5.3 Source Code Completeness

All source code submitted shall be correct, complete, and able to be compiled. The result of the compiled object code shall be identical to that in the storage medium submitted for evaluation or be able to be verified as being functionally identical via a method agreed upon by all parties.

Compilation may be performed at GLI, at the manufacturer's location using a witness build process, or via another method previously agreed upon.

Chapter 2: Requirements for Specific Submission Types

2.1 Introduction

2.1.1 General Statement

In addition to the general submission requirements of the previous chapter, the requirements of this chapter apply to specific Gaming Equipment types.

2.2 Random Number Generator (RNG) Submissions

2.2.1 General Statement

The Random Number Generator (RNG) is an integral part of Gaming Equipment software. It must be carefully tested to ensure that it will meet the technical standards of the requested jurisdiction(s). GLI has developed the methods necessary to test that the RNG and its associated logic are suitable for its intended usage in the desired jurisdiction(s). In order to analyze the RNG in an accurate, efficient, and timely manner, GLI requests that the manufacturer read the overview below to understand the submission requirements which follow.

2.2.2 RNG Submission

In some cases, the RNG shall be submitted with the prototype (full submission) request. An RNG shall be submitted for certification where:

- a) The RNG code has changed or the RNG implementation has changed; or
- b) Where a previously certified RNG is being implemented on a new hardware platform (i.e. change of microprocessor); or
- c) Where a previously certified RNG is generating numbers that are outside scope of what was previously tested; or
- d) The RNG has never been certified before under this standard, in which case the RNG will be certified as a part of the overall submission.

2.2.3 RNG Analysis Overview

The RNG analysis contains three primary items: source code review, statistical data analysis, and software verification. The conclusion contained within the final GLI report will be based off the results of testing conducted within the source code review and the statistical data analysis. The conclusion will only be applicable to the RNG that is identified through software verification. If this identification changes, then the conclusion will no longer be applicable unless the reasons for the changes are examined by GLI.

2.2.4 Source Code Review

GLI will review the code associated with generating random numbers utilized in game play. The RNG and associated logic must be understood so that potential weaknesses may be addressed. In order to perform this area of testing, GLI requires submission of the final source code package associated with the RNG and game software. In the case that a test application is created to pull data from the

RNG, the source code for the test application must also be provided such that GLI can confirm that it generates data in the same manner as the production software.

2.2.5 Statistical Data Analysis

GLI will apply a battery of statistical tests to the data generated by the RNG. The data must be collected using methods that are as close as possible to those used when generating outcomes for game play in the field. If a hardware RNG is utilized in the field, it must also be utilized in data collection. Depending on testing scope, GLI may also collect binary data from the RNG that is not formatted for a specific game and apply a specific analysis adapted for that type of data. In the case that multiple games and configurations are utilized by the RNG, GLI will examine the various games and determine which test cases to utilize in order to properly evaluate the RNG.

Example: Suppose the RNG is to be analyzed for its use in drawing 5 repeatable integer values from 1 to 49 inclusive (picking 5 numbers with replacement). GLI would need to be able to generate, with the test application, a text file containing 51,000,000 records of 5 repeatable integers per record, drawn from a range of 49. The text file should be in a computer-parsable format. The data generated on each line should be generated in the exact manner a live game play would be conducted in the field.

2.2.6 Software Verification

For the final report, GLI will need to be able to uniquely identify the RNG that was tested. This means that GLI will record the key files and their respective signatures (SHA1, MD5, or SHA256) in the report.

GLI will work with the manufacturer to identify all key software components that would have an impact on the RNG for the current scope of testing. The key components will be archived and signature and utilized to verify future submissions in which the RNG is contained.

Example: As a basic example, suppose we have RNG.dll which pulls a seed from a hardware RNG. Next, suppose we have Game.exe which utilizes RNG.dll to generate random numbers in production for the five-reel game example given earlier. Finally, suppose there exists Test.exe which calls RNG.dll to generate the test data described earlier as well. First, GLI will need to be able to verify that the source code provided for review was used to build Game.exe, RNG.dll, and Test.exe. In the simplest case, the manufacturer will send the source code and compiled files. GLI will then compile the files independently. A digital signature is taken of the files compiled by the manufacturer and the ones compiled by GLI. If the signatures match, then it is assured that the supplied code was used to build the supplied compiled files. Alternatively, GLI can conduct a witnessed compile of the manufacturer's product and take the necessary signatures during compilation.

Second, GLI must identify the hardware generator seed source used during testing. GLI will need to confirm that the hardware generator is utilized in data collection and in generating gaming outcomes in the field.

In this example, the report would display the signature of Game.exe and RNG.dll and an explanation of the usage of the hardware RNG. The goal of the software verification is to be able to uniquely identify the tested RNG and its associated source code.

2.2.7 RNG Source Code

Source code shall be final and no longer in test or development. Source code shall be delivered in full along with the compiled binaries. Source code will be compiled by GLI and digital signatures will be

taken during compile to ensure that the product being tested is the final release version that will be implemented in the field.

2.2.8 RNG Final Outcome Collection Tool

A data collection tool along with source code shall be available to allow GLI to collect data in a manner similar to the manner in which game data is produced in the final release version of the production application. This tool must utilize the same RNG and associated methods that are used to generate live game outcomes. The tool shall allow the user to specify, at a minimum, the following input: number of draws/games. The collection tool shall output data in a computer-parsable format.

NOTE: GLI's data collection requirements are large. Please expect that GLI may require hundreds of millions of draws, depending on game format. In most cases, the larger the game range, the larger the number of draws required. Depending on the implementation, data may be collected in hours, days, weeks, or months. If there are questions or concerns about this, please raise them immediately.

2.2.9 Raw Output Collection Tool

If required by scope of work, a binary data collection tool shall be available to allow GLI to collect output from the RNG prior to scaling, shuffling, etc. The data collection should be capable of generating approximately 96 million bits of data written in binary format. Alternatively, the tool may output raw data (un-scaled) in ASCII format.

2.2.10 RNG Description and Documentation.

A technical description of the RNG shall be submitted. This may include appropriate documents detailing the RNG design and construction, as well as details related to methods that manipulate the RNG output (i.e., algorithms related to scaling, shuffling, selection, etc.).

2.2.11 Game Description and Documentation.

A document explaining the game rules shall be submitted. If required to answer specific questions on game functionality, additional information may be requested, such as help screens, pay tables, etc..

2.2.12 Technical Source Code Description and Documentation.

A document explaining the source code is requested to be submitted. This document should have sufficient documentation of the files and methods used so that one can follow the source code logic from the instantiation of the RNG to the generation of final outcome data.

2.3 Game Submissions

2.3.1 Game Artwork

For each game submitted, a legible, color copy or digital image of all game artwork shall be submitted.

NOTE: In some cases, GLI may have the wording on the artwork or game graphics translated to the English language, or have the manufacturer supply an independent translation;

2.3.2 Game Description

For each game submitted, a complete description of the game shall be submitted, including documents that individually or collectively include the following:

- a) All Games:
 - i. All artwork which shows any game rules or payable information;
 - ii. A list of each winning combination along with the pay amount and hits for each prize;
 - iii. A list of pays for each type of win;
 - iv. The denomination(s);
 - v. The minimum and maximum bet;
 - vi. A detailed description of all bonus features supported, their associated payouts, weight tables; and
 - vii. Emulation instructions for all supported base games and bonuses contained in the current submission.
- b) Slot/Reel Games:
 - i. The number of reels;
 - ii. The number of lines and description of each line;
 - iii. The breakdown of the betting scheme for the game, including maximum credits per line, buy-a-pay options, or other schemes;
 - iv. A listing of the logical reel strips, indicating the exact symbols' sequence, if applicable;
 - v. A listing of the physical reel strips, or the method of implementation used to obtain the virtual reel strips, as applicable;
 - vi. A summary of each symbol's frequency, if applicable;
 - vii. A table to cross-reference each symbol type against the abbreviation, if abbreviations are used; and
 - viii. For games that use technologies other than physical mapping or virtual reel mapping, a detailed description of the relationship and steps between the time the RNG value is determined and the symbol is selected, and the relative odds of each symbol being selected via the method;
- c) Blackjack Games:
 - i. Dealer rules;
 - ii. Double-down rules;
 - iii. Pair-splitting rules;
 - iv. Insurance/surrender rules;
 - v. Existence of any side bets; and
 - vi. Number of decks;
- d) Poker Games:
 - i. Poker style (e.g., Draw, Stud, etc.);
 - ii. Special rules (e.g., Wild Cards, etc.);
 - iii. Strategy for auto-hold, if allowed (indicate if auto-hold satisfies an optimal strategy, versus satisfying minimum RTP only);
 - iv. Existence of any side bets; and

- v. Any mathematical work indicating the payback return when using optimum play strategy, if applicable;
- e) Keno/Bingo/Lottery Games:
 - i. Number of balls/spots that can be selected;
 - ii. Number of balls drawn; and
 - iii. Special rules (e.g., Wild Cards, etc.);
- f) Craps Games:
 - i. Odds for each spot;
 - ii. Number of player stations utilized with the game; and
 - iii. Time frame (if any) for betting;
- g) Roulette Games:
 - i. Number of spots (use of '00' or not);
 - ii. Number of player stations utilized with the game; and
 - iii. Time frame (if any) for betting;
- h) Games with Skill:
 - i. Description of skill element(s) and how they impact return percentage for the game;
 - ii. Description of Player vs. Player Advantage features, if applicable;
 - iii. Description of Virtual Opponents, if supported;
 - iv. Description of Player Advice features, if applicable;
 - v. Description of any "discovery features", if supported;
 - vi. Supporting information related to any "knowledge store" database used by the game design, for example, a trivia database;
 - vii. Information on any special log files or metering that is supported, as applicable;
 - viii. Assumed player strategy used for theoretical hold calculations and related details for same;
 - ix. If available, actual game return statistics from simulations or field trials of the game; and
 - x. If available, simulators or bots that may be used to facilitate mechanized testing, or any other specialized tools that may facilitate testing and analysis by GLI;
- i) Virtual Event Wagering:
 - i. Details of all virtual event wagering types to be provided including descriptions of the virtual events and wager types;
 - ii. Copies of all proposed rules, including all prize tables or other such parameters, for each virtual event wagering type;
 - iii. A description of how virtual event wagers are settled; and
 - iv. A description of the in-play wagering process, if applicable, including selection of events, information offered to players in advance, dedicated technology, etc.
- j) Progressive Jackpots and Incrementing Jackpots:
 - i. All progressive jackpot and incrementing jackpot features;
 - ii. The number of levels of progressive jackpots and incrementing jackpots;
 - iii. The startup value, reset value, and increment rates for each level;
 - iv. Any hidden increments, secondary increments, or alternate jackpot reseeding functionality; and
 - v. The rules for winning each progressive jackpot and incrementing jackpot.

2.3.3 Calculation Sheets

For each game submitted, the manufacturer shall supply the calculation sheets (i.e., PAR sheets) that determine the theoretical return to the player (including the base game, double-up options, free

games, progressive features, bonus features, etc.). Where different player options (e.g., number of credits bet) result in variations to the paytable, a separate calculation for each supported option is required.

If the game math is solved programmatically, wholly or in part, the manufacturer shall provide all source code involved in that process as well as the compiled executable.

2.4 Gaming Device Submissions

2.4.1 Gaming Device Submissions

Each Gaming Device submission shall contain the following:

- a) A written Statement of Verification that a previously certified Random Number Generator is used within the submitted software;
- b) A master manual explaining all diagnostic tests, meters, game configurations, error conditions and how to clear them;
- c) Communication protocol support;
- d) Critical NV memory clear procedures;
- e) Program block diagrams and flow charts for the software, including a clear mapping of the RNG selection process and complete authentication schema, if applicable;
- f) For all software involved in the control of critical gaming functions; provide an assembler, linker, formatter, or other compilation utility necessary to compile the gaming software from the submitted source code. This requirement may be waived where program code is written in machine code and the listing file (showing the assembled and linked code) is provided. If a non-PC-based platform development system is used, the manufacturer shall supply GLI with the necessary computer equipment and software necessary to compile and verify the final executable program. Any alternative to compilation by GLI (e.g., witnessing source code compilation) must be discussed prior to submission;
- g) An indication of all critical NV memory allocation addresses including how critical NV memory is checked and when it is checked;
- h) The tools and procedural instructions necessary to download critical NV memory from the gaming device and to review and analyze the contents of that critical NV memory in the event of a forensic investigation. In addition, the manufacturer shall supply a method which will allow GLI to upload a copy of the critical NV memory to another logic board populated with identical control program components. Upon the completion of this procedure, the new logic board should allow the Gaming Device to reproduce the last known game state that was present on the forensic logic board;
- i) Documentation detailing the means of third-party verification for all program storage devices; and
- j) Technical documentation detailing procedures that can be used to verify low battery and meter rollover functionality.

2.5 Jackpot Submissions

2.5.1 Jackpot Controller

In addition to the materials listed in the applicable hardware or software submission sections above, jackpot controller submissions shall include detailed documentation containing information on the hardware and software configuration supported by the jackpot controller, including but not limited to the following:

- a) An overview of the controller architecture, including the integration of all controller hardware and software;
- b) The type of jackpots/pools supported by the controller and instructions on how to configure each type (Standalone, Linked, Multi-Site, Progressive, Incrementing, Mystery, etc.), including all hardcoded limits that might exist;
- c) For mystery-triggered jackpots utilizing an RNG incorporated within the controller, the “Random Number Generator (RNG) Submissions” requirements would apply.
- d) For each supported jackpot type, a description of the incrementation scheme, pool architecture, and triggering methods;
- e) A description of the accounting functionality supported by the controller, including detailed descriptions of each meter and how they are incremented;
- f) A description on the communication protocols utilized by the controller to communicate all wager and jackpot amount information to connected gaming equipment;
- g) If applicable, a description of how any Controller boards communicate with the gaming machine.
- h) A description of all supported tilt codes, and the triggering criteria for each tilt;
- i) A description of how the jackpot value is displayed;
- j) A description of the location of the jackpot controller and the housing unit;
- k) The number of jackpot displays which the jackpot controller can support;
- l) A description of the events which occur when a jackpot is won; and
- m) The means of clearing the jackpot controller NVRAM.

Additionally, program block diagrams and flow charts for the jackpot system should be provided, if requested.

2.5.2 External Jackpot Display

The documentation accompanying the display shall explain how the display drivers are interfaced to the controller and how the display is interfaced to Gaming Equipment. If the display is provided for multi-tier jackpots, indicate the operation in this respect.

2.6 Kiosk Submissions

2.6.1 Kiosk Submissions

In addition to the applicable hardware and software requirements listed above, the following items shall accompany each kiosk submission:

- a) All components needed to configure the kiosk with the system(s) it's compatible with, as it would be configured in a live environment. This includes all communication, bill acceptor, printer, etc. hardware and software.
- b) A list of the system(s) the kiosk will be connected to, including the minimum supported system version number(s). A description of any system application(s) needed to interface to the system(s), including the minimum supported system application version numbers;
- c) Documentation describing how to add the kiosk to the host system. Include any specific flags or fields used to identify the kiosk separately from other devices. (e.g., "Kiosk is entered as a gaming device with a number greater than 9999" or "Kiosk is entered as a gaming device with flag called 'calculation type' set to Other," etc.);

2.7 General System Submissions

2.7.1 General Statement

Due to the variant ranges of systems and potential sizing limitations, each system will have to be reviewed on an individual basis for custom submission requirements.

2.7.2 System Hardware Submissions

Each submission of system hardware shall contain the following:

- a) Server, Associated Database(s), Front End Controller, Data Collector, Game Controller and Ancillary Stations to include but not limited to:
 - i. Jackpot/Fill functionality;
 - ii. Cashier Station functionality;
 - iii. System Parameters Configuration Management functionality;
 - iv. Surveillance/Security Monitor functionality;
 - v. Gaming Equipment Management functionality; and
 - vi. Accounting/Reporting Functionality;
- b) Monitors, keyboards, mouse, printers, etc., to support the items listed above;
- c) A minimum of seven interface element devices with corresponding power connectors (if separate from harness), keypads, displays, and, as applicable, card reader (or equivalent if an alternative media is used) needed to fully connect a set of gaming equipment to the system;
- d) A minimum of one wiring harness for each component type desired for operational approval with system where specific harnessing is required;
- e) A minimum of two of each type of magnetic cards (or equivalent if an alternative media is used) supported by the system (player cards, employee cards, diagnostic cards, etc.), if applicable;
- f) Network cabling, hubs, switches, and any wireless components that may be installed at a property;
- g) As applicable, any consumables used to facilitate testing, such as a supply of preprinted raffle tickets, bingo card faces, decks of cards, or blank ticket stock; and
- h) An un-interruptible Power Supply (UPS) for critical components.

NOTE: In an effort to reduce system submission size, monitor and data switches may be used. Additionally, separate software may be housed in the same unit, as long as the functionality is not impaired, and the software is identical to the field version.

2.7.3 System Software Submissions.

Each submission of system software shall contain the following:

- a) Details of the physical location of each component of the system, where stored in multiple locations;
- b) All user manuals in either hard or soft copy format to include a general overview of the system from a component level, software and hardware setup and integration, and system block diagrams and flow charts for the communication program, if required;
- c) If not included in the user manuals, detailed functional descriptions of the following technical functionality available on the system, including, but not limited to:
 - i. Logging Capability,
 - ii. Communications Capability, including a list of all supported communication protocols specifying version, if applicable,
 - iii. Operator Interface to Player Accounting,
 - iv. System Accounting and Financial Reporting Capabilities,
 - v. Payment Systems & Financial Institution Interfacing,
- d) For systems which interface with other Gaming Equipment, if not included in the user manuals, a connectivity manual for all unique components capable of being interfaced with system to include component model numbers and compatibility list, if applicable; wiring diagrams depicting connection points to components, power, etc.; and identification by part number or some other scheme, any unique wiring harnesses, ancillary boards required for communication of a particular component;
- e) If not included in the user manuals, documentation pertaining to all available configurable parameters and concise instructions on configuring each parameter;
- f) If not included in the user manuals, example reports for each standard report capable of being generated on the system with a formula summary detailing all reporting calculations including data types involved, mathematical operations performed, and field limit;
- g) If not included in the user manuals, documentation pertaining to all supported communication protocols, specifying version, if applicable;
- h) If utilizing a software verification algorithm, a description of the algorithm, theoretical basis of the algorithm, results of any analyses or tests to demonstrate that the algorithm is suitable or the intended application, rules for selection of algorithm coefficients or "seeds", and means of setting the algorithm coefficients or "seeds;"
- i) Where a system requires the use of defined user roles with associated passwords or pin numbers, a default list of all users and passwords or pin numbers including a method to access the database and the details of each class of account required to operate the system in a production environment (e.g. System Administrator, Operator, Hotline, Network support), including the privileges required to perform the duties associated with that account; and
- j) If completed by the manufacturer, a system test plan and results to detail Gaming Equipment and software versions tested with.

2.7.4 Modifications to Existing or Create New System Functionality

The following information may be required to process the submission:

- a) If new, a complete description of the function, including amendment manual and user documents, and new source code if applicable; and
- b) If modifying, a description of the software change(s), modules affected, new source code, and test case scenarios to validate the modifications fully, if applicable.

NOTE: Modifications to the supporting environment which do not impact the functionality of the component(s) under evaluation need not be resubmitted as these elements are not evaluated in our laboratory in the first place and are only required to provide the supporting environment for the component under test. However, any environmental changes which in any way change the functionality of the component(s) under evaluation must be re-certified. Where there is some doubt over whether a system should be resubmitted then these situations will be considered on a case by case basis.

2.8 Player Account Management Submissions

2.8.1 Player Account Management Submissions

The “Player Account Management” includes the components of the system which form the primary interface for the player. The Player Account Management interface provides the player with the means to register an account, log in/out of their account, modify their account information, deposit and withdraw funds to/from their account, request account activity statements/reports, and close their account. In addition, any web pages displayed to the player which relate to gaming or wagering, but which are not an actual game/wager screen, are considered to be part of the Player Account Management components. In addition, the following documentation must be submitted for the evaluation of the Player Account Management components:

- a) Detailed functional description of the Player Account Management components (including, where online management is supported, the website home page and all website peripheral pages);
- b) Detailed descriptions of the following technical functionality available on the system, where supported:
 - i. Player Account Registration;
 - ii. Player Identity Verification;
 - iii. Player Account Login (Username & Password);
 - iv. Player Interface to Player Account;
 - v. Player Protection Features;
 - vi. Privacy Policy;
 - vii. Player Account Deactivation;
- c) Detailed description of how player verification information is protected from unauthorized access;
- d) Detailed description of player authentication (i.e. how registered player identify themselves to the system each time they connect);
- e) Description of how player registration and account information (including credit card information where applicable) is to be protected from unauthorized access;
- f) Description of the register of unclaimed prize monies and how it is maintained; and

- g) Description of the treatment of revenue from expired, unclaimed wins.

2.9 Gaming and Wagering System Submissions

2.9.1 Gaming and Wagering System Submissions

In addition to the requirements of the “General System Submissions” section, the requirements of this section apply to systems directly involved the conduct of gaming or wagering, such as Server Based Gaming Systems, Interactive Gaming Systems, Event Wagering Systems, and Wireless Gaming Systems. The following documentation must be submitted for the system evaluation:

- a) Detailed functional description of the system components (including where applicable, the website home page and all peripheral pages and Geolocation Software; and
- b) A list of all games/events hosted/offered on the system.

2.10 Player User Interface System Submissions

2.10.1 Player User Interface System Submissions

The following items are required to accompany a Player User Interface (PUI) System submission:

- a) The PUI System that operates the System Window functions shall be submitted along with all supporting operators’ manuals and technical specifications. If the PUI System is comprised of components from various manufacturers, then each manufacturer shall submit their own component which may be done independently;
- b) The supporting documents must include all possible functional options, system capabilities, communication protocols used, and display recall information;
- c) Video mixing hardware and software except for equipment that was previously submitted and approved;
- d) Source code for any re-mapping of the Game Window display program or component;
- e) The PUI System supplier shall supply the needed tools to validate the requirements of this standard, if required.

2.11 Information Systems Security (ISS) Submissions

2.11.1 General Statement

Information Systems Security (ISS) refers to the physical, environmental, administrative and technical features implemented to maintain the security and integrity of the environment.

2.11.2 Information Security Policy

A copy of the Information Security Policy must be submitted, including:

- a) Details of the physical security processes implemented to protect the production environment;

- b) Details of where and how each category of information (e.g. critical, important, not important) is stored in the system, and the risk assessment and protection measures implemented for each category of information;
- c) Details of the password protection systems and associated algorithms utilized by the system;
- d) Details of the method of transaction logging used;
- e) Details of how self-monitoring is implemented;
- f) Details of the encryption methods used for the secure storage of critical information;
- g) Controls to prevent unauthorized use of operator consoles or accounts, and for the prevention of unauthorized access to information which may aid unauthorized access to the operator consoles or accounts (such as usernames, IP addresses or passwords);
- h) Details of the incident management system implemented by the operator;
- i) Details of the disaster recovery plan implemented by the operator;
- j) Details of audit reports available from the system; and
- k) Reports showing how often the Information Security Policy is reviewed.

2.11.3 System Components in the Production Environment

Details and functional specifications of all system components in the production environment must be submitted including, but not limited to:

- a) Platform Hardware, such as Servers, Firewalls and Intrusion Detection Systems, Operator Consoles (local and remote), Gateways and Access Points, Remote Controllers, Remote Access Servers, Multiplexing Equipment, Switching Equipment, Monitoring Equipment, Hubs, Switches and Routers, and Repeaters.
- b) Operating Systems,
- c) Applications,
- d) Audit Subsystems, including any built-in functionality of the operating systems and applications used for audit purposes,
- e) Duplication Strategy,
- f) Disk Subsystem, and
- g) Back-up facilities.

2.11.4 Network Architecture Diagram

A network architecture diagram must be submitted, including the following:

- a) Network topology,
- b) Devices used to create the network,
- c) Internal and external IP addresses for all devices,
- d) Controls to prevent unauthorized modification to device configurations,
- e) Local Area Network (LAN) and Virtual Local Area Network (VLAN) design, including all functional subnets and firewalls,
- f) Details of the gaming platform connections to the Internet, and
- g) Details of any remote connections (e.g. Internet, wide area network, dial-up) used to support system operations.

2.11.5 External Systems

A list must be submitted of all non-production systems (e.g. MIS) and third-party systems that will connect to the system. For each external system provide:

- a) The connection method (e.g. dial-up, X.25, leased line, Internet).
- b) Details of the information to be transferred in each direction.
- c) The entity that initiates the information transfer.
- d) The protocol used to perform the transfer.
- e) Controls to prevent access to other information on the system.
- f) Controls to prevent unauthorized use of the connection.
- g) Controls to prevent eavesdropping on communications between non-production systems and the system.

2.11.6 Network Management System

Details of any Network Management system associated with the internal production network must be submitted, including:

- a) Physical location of the Network Management system.
- b) Class of personnel authorized to use Network Management system.
- c) Locations from where network management functions can be executed.
- d) Network management protocol.
- e) The devices to be managed on a read only basis.
- f) The devices to be managed on a read/write basis.
- g) Controls to prevent unauthorized access to network management functions.
- h) Controls to audit the use of network management functions.
- i) Controls to detect unauthorized connections to the network.
- j) Controls to detect connection of unauthorized equipment to the network.
- k) Describe the locations and physical and logical security arrangements associated with secondary DNS servers.

2.11.7 Data Encryption and Communications

For the data encryption and communications between the system components, the following information must be supplied:

- a) Details of the message authentication algorithm used:
 - i. Description of the algorithm,
 - ii. Theoretical basis of the algorithm,
 - iii. Results of any analyses or tests to demonstrate that the algorithm is suitable for the intended application,
 - iv. Rules for the selection of keys,
 - v. Rules for changing keys,
 - vi. Means of generating and protecting keys.
- b) Details of the encryption to be used during game play and wagering, including:
 - i. Encryption algorithm,

- ii. Size of encryption keys,
- iii. Key generation process,
- iv. Key storage process,
- v. Key exchange procedure at session start-up,
- vi. Subsequent key exchanges,
- vii. Key revocation process in the event keys are compromised, and
- viii. Details of any information that is not encrypted for transmission.

2.12 Network Security Submissions

2.12.1 Network Security Submissions

Due to the unique nature of network security certification (i.e. essential phases of certification will occur within the gaming property) submission requirements for these system types will be handled on a case-by-case basis between the parties requesting certification and GLI. These submission requirements may include, but will not be limited to:

- a) Hardware and software components needed to build the network for testing purposes;
- b) Application source code;
- c) Build instructions;
- d) Database scripts;
- e) Installation policies and procedures;
- f) Network diagrams; and
- g) Identification of system components which may vary between installations.

NOTE: Any recommendations provided should be viewed as additive or supplemental to any standards-based certification and must only be enforced as applicable and appropriate to the specific network in question. It is also important to acknowledge here that any certification of a network's security would typically require a multi-phase analysis approach. For example, GLI could evaluate certain network components such as modems, bridges, routers, servers, etc., on a standalone basis to determine if the specific component satisfies certain network security guidelines. However, in most cases, it is expected that a second phase of analysis would be required, using the actual live network. Analysis of the overall network, with all components properly configured is the ultimate test-bed for any network security certification.

Revision History

Date Released/Revised:	Version	Revision
March 23 rd , 2020	2.0	Release of updated requirements.
September 30 th , 2019	2.0 DRAFT	Overhauled entire document to remove redundancies. Categorized based on Submission Type, not GLI Standard. Added additional requirements as necessary and clarified based on actual need.
May 26, 2017	1.3	Revised Chapters 1-10 and Chapter 19 to include compatibility environment documentation requirements.
September 8, 2016	1.2	Revised Chapter 1 to reflect update to GLI-11 V3.0 and to add previously missing chapter content for GLI-19, GLI-23, and GLI-31. Revised RNG submission requirements for GLI-11 to better reflect current practices. For GLI-11, added baseline submission requirements unique to “games with skill” and “virtual event wagering”. Made other formatting, grammatical, and structural changes throughout the document.
July 20, 2012	1.1	
September 20, 2011	1.0	Initial Release