



Jackpot systems minimum technical requirements (casinos)

Version 2.1

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1 Introduction

This document describes the principles and technical requirements pertaining to Jackpot Systems in Queensland casinos (also known as Gaming Systems in this document) and Jackpot Display Systems. **Note:** If an existing jackpot system has already been approved for the casino markets in New South Wales or Victoria, the Chief Executive may consider it acceptable in Queensland. The final decision rests with the Chief Executive.

All jackpots and jackpot systems in Queensland casinos must be designed in a way that prevents any exacerbation or negative influence on player's gaming, thereby safeguarding them from potential harm and promoting safer gambling behaviours.

For the minimum technical requirements for jackpot systems in Queensland Clubs and Hotels, please refer to the following document:

“Jackpot systems minimum technical requirements”

Policy:

All Gaming Systems must be submitted to the Office of Liquor and Gaming Regulation (OLGR) for evaluation and approval.

Purpose:

The purpose of this document is to:

- advise the casino industry of OLGR's Gaming System principles and minimum requirements
- ensure requirements are consistently applied
- achieve a high standard of integrity of Gaming Systems
- ensure security of Gaming Systems increases appropriately in proportion to risk

Scope:

As a set of policies and requirements, this document is only applicable to Jackpot Systems operating in the Queensland casino market. This document covers all casino jackpot types including jackpots offered via electronic gaming machines, fully automated table games, electronic table games or traditional table games.

If it can be demonstrated that a requirement in this document is not applicable to a particular jackpot system, then an exemption may be granted on that requirement. All exemptions to individual requirements must be granted in writing.

2 Definitions / Abbreviations

2.1 General

ANZ GMNS

Australian/New Zealand Gaming Machine National Standard

Average Trigger Value (ATV)

ATV refers to the average win pertaining to a prize, or prizes (depending on context) in a Gaming System.

Betting Terminal (BT) *(formerly known as 'Contributing Device')*

A Betting Terminal refers to any device in the Gaming System that accepts bets from participating players. The BT's role after accepting a bet is to forward the bet as contributions to applicable components in the Gaming System (e.g. the Prize totaliser and the Prize Triggering Device). A BT may be a discrete device or incorporated into any combination of a Prize Triggering Device, Jackpot Display System or Prize Totaliser. EGMS, Fully automated table game (FATG) terminal with jackpots or table game jackpot managing device are BTs.

Ceiling

Refers to a progressive prize's maximum value at which the prize amount is capped (or frozen to prevent further increment from contributions). Typically, once the prize level ceiling is reached, contributions will then go into an overflow meter.

Contributions

Refer section 8

Current Amount Current Value

Both the above terms refer to the amount that would be awarded for a given prize / jackpot if won at that instant.

Database

In this document the term 'database' refers to a component of an overall Gaming System which is typically a part of the Gaming System 'host' computer. It typically stores all events associated with the operation of the Gaming System, the BT database, the bet database (if applicable), parameter database and any database associated with the maintenance and operation of a Gaming System.

Electronic Gaming Machine (EGM)

Means “Slot Machine” or “Poker Machine”. For the definition of an EGM, refer to the Queensland Gaming Machine Act. Primarily a Betting Terminal, a gaming machine internally offers a range of prizes/jackpots but may also be a part of a “Linked Jackpot Arrangement” as defined in the Act.

Electronic Seal

Refers to the Electronic Seal as specified in the ‘OLGR Electronic Seal Minimum Requirements’ document.

Electronic Table Game (ETG)

ETG means a game system which facilitates a factual representation of a table game, including fully automated table games, which operate independently or in connection with a live table game, and can be played on a player terminal. An ETG may be part of a progressive jackpot link arrangement.

Fully automated table game (FATG)

FATG is defined in the Casino Control Regulation 1999. Refer OLGR Minimum technical requirements for fully automated table games. A FATG may be part of a progressive jackpot link arrangement.

Gaming System (GS)

A Gaming System refers to any type of computer based wagering, jackpot or prize awarding system as a whole. At the broadest level, a Gaming System accepts bets and gives a corresponding chance of winning a prize and then awards (or notifies) when prizes are won.

An example of a Gaming System is a linked jackpot arrangement comprising of EGMs.

Refer to section 3.2 for a breakdown of a Gaming System’s major components.

Host

A component of an overall Gaming system that is a computer system that controls and manages a Gaming System by facilitating functions such as creation / deletion / configuration of prize parameters, performs adjustments and gaming system management functions such as adding and removing BTs and gaming venues, etc. It typically also encompasses the database associated with the overall Gaming System.

Jackpot

A jackpot is simply another name for a ‘prize’. Refer ‘Prize’ below. In common language it typically refers to the higher prizes made available in a Gaming System.

Jackpot Controller

Means ‘Prize Totaliser’.

Jackpot Level

Means 'Prize Level'

Jackpot System

Means 'Gaming System'.

Jackpot Triggering Device

Means 'Prize Triggering Device'.

Level

Refer to Prize Level below

Linked Jackpot Arrangement

This term is defined under the *Queensland Gaming Machine Act*. Also refer 'progressive jackpot link arrangement' as defined in the Casino Control Regulation 1999.

Linked Prize (LP)

Refer to section 3.1.4.

Overflow

Refers to the total additional contributions received for a progressive prize amount after a progressive prize has been capped at its Ceiling by the Gaming System's Prize Totaliser. Amounts in the overflow are typically added to the next start-up amount after the prize is next triggered.

Post Draw Close Attacks

The act of either creating a new bet, or altering an existing bet, or details thereof, after the point in time for which betting for a game, play or outcome has closed (typically for nefarious means). This form of attack can be performed either before or after an outcome has actually been determined in order to succeed.

Prize or Prize Level

Each prize that can be won as a result of playing the Gaming System may also be referred to as a 'prize level', 'level', or simply as a 'prize'. Typically progressive prizes are referred to as prize levels.

For example, a Gaming System may comprise a Grand prize, Major prize and a Minor prize. The prize levels in this system are the Grand, Major and Minor levels.

Prize Totaliser (PT) (formerly termed 'Jackpot Controller')

This term refers to the device which totalises the progressive prize amount in a Gaming System (e.g. taking a percentage of each bet made and adding it onto the value of a prize – commonly referred to as a progressive prize). The Prize Totaliser accepts contributions from BTs and takes a percentage and adds it to the applicable prize's current value. A Prize Totaliser may be a discrete device or incorporated into any combination of a Prize Triggering Device, Betting Terminal or Jackpot Display System.

Prize Triggering Device (PTD) (formerly termed 'Jackpot Triggering Device')

Arguably the most important part of any Gaming System as this device essentially **creates money** via its purpose built function of triggering prizes based on a Triggering Methodology. A PTD refers to the device/s in the Gaming System (there may be more than one), which, based on received contributions (or bets), directly triggers prizes. PTDs (under these requirements) must also directly or indirectly by inference, decide or prove which are the winning BTs (or bet/s). A PTD always incorporates an RNG. Also refer to Betting Terminal and Prize Totaliser. A PTD may be a discrete device or incorporated into any combination of a Betting Terminal, Jackpot Display System or Prize Totaliser.

Program Storage Device (PSD)

Refers to a physical device that stores programs. These devices are usually EPROM, Flash ROM, Hard Disk, CDROM or DVDROM.

Random Number Generator (RNG)

An algorithm or device which provides random numbers on demand and in the context of this document is typically for the purpose of the triggering of prizes in a Gaming System. The RNG is an inherent part of any PTD. Also refer to the OLGR RNG Minimum Requirements document.

Return To Player (RTP)

Refers to the 'percentage return' of an individual prize, game, or Gaming System; depending on context 'percentage return' can be defined empirically as $\text{Total Wins} / \text{Turnover} \times 100$. RTP is typically expressed as a percentage 0...100%. A way of interpreting an RTP value is, for example, an 85% RTP would mean that for every dollar bet, the average prize (includes prizes of zero) would be 85 cents.

Seal

This term typically refers to an OLGR approved tamper seal used for physically sealing devices deemed at risk from tampering. For example, Prize Triggering Devices (PTDs)

Stand Alone Prize (SAP)

Refer to section 3.1.4.

Totaliser

Refer 'Prize Totaliser'

Triggering Methodology

Refers to the methodology of how a prize is triggered and awarded back with respect to a particular bet.

Vanilla Progressive

Refers to the simplest form of a progressive prize level; comprised of the following parameters: Start-up (SUP), percentage increment (PINC) and a hit probability (p) and obeys the simple progressive prize level formulas listed in section 14.11

Walkaway

In this document the term 'Walkaway' is deemed to have occurred when a prize is awarded via a BT that no longer has a player in attendance, e.g. when a player leaves the BT before the bet/play outcome has been displayed, or even leaves the BT not realising that they have won a prize.

Gaming systems most at risk from walkaways are Gaming Systems which run on top of an existing gaming device (e.g. a gaming machine) where there exists some variable level of latency or potential loss of connectivity between the process of the player starting a play and all participating Gaming Systems responding in a timely manner e.g. A common arrangement where a risk of walkaways occur is a Gaming System where the PTDs are physically separate from the BT.

2.2 Jackpot Display System Definitions

Idle Animation

An animation which does not contain 'jackpot artwork' that is displayed in between the display of jackpot artwork

Jackpot Artwork

Refers to any form of animation, artwork or information which:

- indicates the current amounts of the jackpot system;
- relates to a jackpot win;
- relates to the determination of a jackpot win; or
- contains any rules relating to the jackpot system.

An animation which displays fireworks with the message "Grand Jackpot Won" is an example of jackpot artwork.

If anything partially contains jackpot artwork, then it will be considered jackpot artwork. For example, if idle animations are being displayed between displaying current amounts, then the entire animation (inclusive of the idle animations) shall be considered jackpot artwork.

Jackpot Display

A Jackpot display is any device which publicly displays jackpot artwork.

e.g. a computer screen, plasma screen, LCD screen or LED display which is used for displaying animations resulting from a jackpot win, or a sign which is publicly displaying jackpot rules such as “Jackpot Range between \$100 and \$1000”.

Jackpot Display Controller

A jackpot display controller is a device which forms jackpot artwork using information collected from a monitoring system (or through a device which is connected to a monitoring system e.g. an EGM), and then outputs this jackpot artwork for display on a jackpot display.

Examples of a jackpot display controller are:

- A BT that controls its own jackpot display;
- A device which gathers information from the monitoring system by packet sniffing a gaming system related protocol and displays this information on a screen; and
- A device which gathers information by communicating directly to a monitoring system and displays this information on a screen.

Jackpot Display System (JDS)

A jackpot display system contains any combination of jackpot display controllers, jackpot displays and jackpot artwork. As the name suggests its role is to display jackpot artwork and currents amounts to players.

Win Animation

An animation that is displayed upon a jackpot win.

3 Categories - Prizes / Components

3.1 Categories of Prizes

This section defines categories of prizes as referred to throughout this document.

3.1.1 REGULATORY or PROMOTIONAL

Gaming Systems can be classified as either “Regulatory” or “Promotional”.

REGULATORY Gaming System fall under the jurisdiction of the *Casino Control Act 1982*.

PROMOTIONAL Gaming System fall under the jurisdiction of the *Charitable and Non-Profit Gaming Act 1999*.

3.1.2 DETERMINISTIC or NON-DETERMINISTIC

In this document, DETERMINISTIC or NON-DETERMINISTIC is a reference to the type of **prize triggering algorithm** a prize/jackpot utilises.

A prize with a deterministic triggering algorithm is where the probability of winning the prize does not remain constant over time for the same repeated bet i.e. future prize trigger probability is dependent on previous events in time.

Typically with a deterministic prize triggering algorithm the probability of winning a prize increases over time (i.e. each subsequent bet) and resets to a lower value after each prize hit.

Prizes with a deterministic triggering algorithm often have a non-visual or “secret” component to them.

A type of prize with a NON-DETERMINISTIC triggering algorithm is where the probability of winning the prize remains constant for repeated constant bet amounts regardless of the current prize levels.

Examples

One example of NON-DETERMINISTIC triggering algorithms would be a prize awarding system based on the betting on the outcome of a roll of a dice or a toss of a coin.

One example of a DETERMINISTIC prize triggering algorithm in machine gaming is where there is a progressive prize with a start-up and a ceiling and a randomly chosen (secret) trigger point in between. For each bet, a percentage (or all) of the bet is added to the prize value. When the prize value reaches the secret trigger, the prize is awarded and the prize resets. There is no overflow as the prize is guaranteed to trigger before it reaches the ceiling.

A less technical analogy that demonstrates an algorithm that reflects a DETERMINISTIC triggering algorithm is life insurance. When life insurance is treated as a bet (i.e. a premium) with the prospect of the prize being awarded (albeit the prize is awarded to the beneficiaries), a property of the life insurance *prize triggering algorithm* is that (given human mortality) the probability of death increases over time.

A special category of non-deterministic prize triggering algorithms:

It is possible to implement a prize using a deterministic prize triggering algorithm in such a way that (under certain conditions) the prize can behave mathematically like a prize with a non-deterministic prize triggering algorithm. These types of prize triggering algorithms still have the security risks of prizes using deterministic triggering algorithms (i.e. in that the PTD must still keep a secret). However, for all intents and purposes, under these requirements prizes that the OLGR concur fall into this category will be considered as **non-deterministic**.

3.1.3 PROGRESSIVE

A prize is a PROGRESSIVE prize when the prize value increments, typically as a percentage of bets made in the Gaming System.

3.1.4 LINKED or STAND ALONE

If a prize is only winnable on a single BT and the BT is also the Prize Totaliser and the PTD, then it is considered a STAND ALONE prize. All other prizes are considered to be LINKED prizes. A LINKED prize is when more than one BT is competing for the same prize amount.

3.1.5 LOCAL AREA (LA) or WIDE AREA (WA)

If a prize is LINKED and the prize is restricted to a single gaming venue (in-house) or organisation, it is considered to be a Local Area (LA) prize.

Otherwise if the prize can be won over two or more gaming venues operated by separate organisations, then it is considered to be a Wide Area (WA) prize.

Typically the distinguishing factor between LA & WA GS, is that in a LA GS the prizes are paid by the hosting gaming venue, where in a WA GS the prizes are typically paid from a trust account fund operated by a 3rd party.

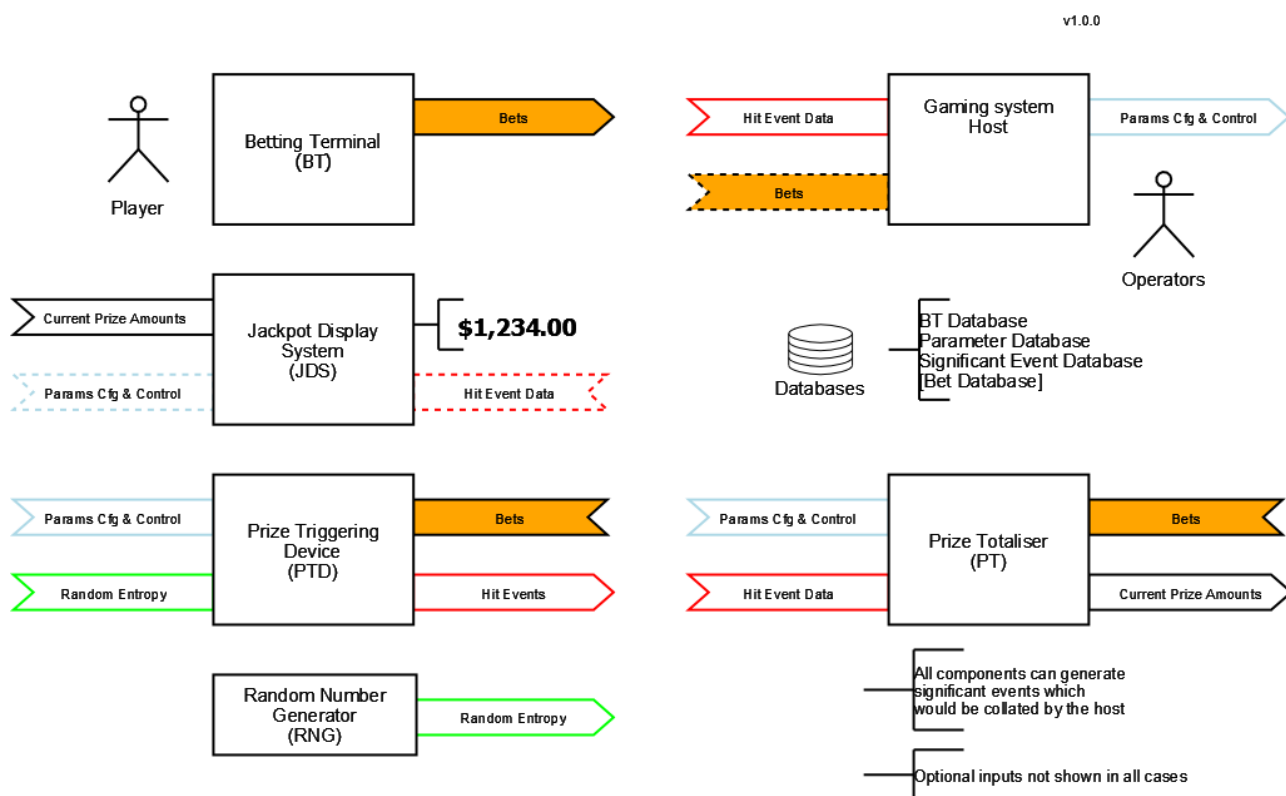
3.2 Components of Gaming Systems

In this document a Gaming System is divided up into the following components and roles for reference purposes:

- Betting Terminal/s (BT/s),
- Prize Totaliser/s (PT/s),
- Jackpot Display System/s
- Prize Triggering Device/s (PTD/s)
- Random Number Generator/s (RNG/s)
- Host / host computer
- Database/s (typically a part of the host)

Refer to each components definition in section 2 for more information on each component. Note that each component of a Gaming System is not necessarily a discrete device in the system but may simply refer to a given role within the overall Gaming System and may be a combination of multiple roles/components.

Gaming System Components – Major Inputs and Outputs



4 Gaming System Submission Requirements

All submissions must comply with the latest version of the “OLGR Submission Requirements” document in addition to the following requirements:

- 4.1** Each Gaming System submitted must have a unique product name for identification purposes.
- 4.2** A functional description

The functional description must be complete and verbose and including system specifications. *This is the most important submission item.* The functional descriptions must allow an evaluation of the Gaming System against this document without further submissions being made.
- 4.3** The submission documentation must include a detailed functional description of all prize triggering methodologies utilised (including any methodologies used to select a winning BT after triggering a win).
- 4.4** A block diagram of the Gaming System

The block diagram must clearly identify all the components of the Gaming System and cross reference them to the theoretical components of a Gaming System as defined by this document (refer section 3.2) i.e. the block diagram must identify the major components as defined by this document such as the Gaming System host, BT/s, Prize Totaliser/s, PTD/s, RNG/s and Jackpot Display System/s.
- 4.5** All submission material must be submitted in electronic format.
- 4.6** The submission covering letter (refer submission requirements document) must also contain a secure hash result of accompanying electronic submission material.
- 4.7** A list of all known non-conformances against applicable requirements in this document or other applicable standards and requirements.
- 4.8** Sanity tests must be applied to all contributions in a Gaming System every time they are passed between modules/devices (refer 8.3). Accordingly, in the Gaming System submission, supply a summary list of where each type of sanity test occurs, and the value/formula of the sanity limits & checks.
- 4.9** A summary of all provisions in the Gaming System which are used to prevent Walkaways (refer “walkaways” and section 11.8.3) must be submitted.
- 4.10** Source code of any device in the Gaming System is generally required. Dispensations in this regard are at the discretion of OLGR.
- 4.11** Digital photographs of each type of Gaming System physical component.
- 4.12** Installation, operating and service manuals.
- 4.13** A risk / threat assessment may be required. Refer 5.9

4.14 PTD submission material must also contain the following information:

- PTD source code that is complete and able to be compiled (Refer 10.12).
- The PTD RNG algorithm and scaling algorithm must be specifically submitted (Refer OLGR RNG Minimum Requirements).
- Supply any hardware and software needed to undertake a verification of a REGULATORY PTD's program storage devices (Refer 10.18).

5 General

5.1 Gaming System operators must have adequate controls and safeguards in place to ensure the integrity and auditability of the system and its operation.

5.2 Fault Tolerant Storage.

All Gaming System contributions and variables pertaining to the current amounts must be stored fault tolerantly by the Gaming System. The minimum fault tolerance at any time is error detection with correction using multiple logical copies. (Preferably try to maintain at least two separate physical copies on separate devices for as much of the time as possible.)

5.3 All submitted Gaming Systems must have a unique name.

5.4 Each separate physical component in the Gaming System must be labelled with the following information:

5.4.1 Manufacturer/Supplier name

5.4.2 Model name/number

5.4.3 A label denoting its overall function where not obvious (black box devices particularly need labelling e.g. Prize Controller (combined PT & PTD), Prize Totaliser, PTD, Jackpot Display, Jackpot Display Controller, Jackpot Display System etc)

5.5 A Gaming System operator or payer can only offer prizes if they have (or have access to) sufficient funds to pay the prize if triggered.

5.6 For Gaming Systems containing only EGMs as BTs; then other than the bet to initiate play on an EGM, no additional contribution or bet shall be required to participate in the Gaming System.

Otherwise, if an additional bet is required to participate in a Linked Jackpot Arrangement, the Gaming System must conform to any related regulatory or local requirements for the jurisdiction (e.g. Minimum/maximum RTP etc).

5.7 For auditing purposes and to minimise the potential for confusion, each BT may only participate in one REGULATORY Linked Jackpot Arrangement at any time.

5.8 In an EGM related Gaming System, if a Gaming System's RTP forms part of the regulatory minimum percentage Return to Player of the EGM's game, then the participating EGMs must be automatically disabled if the Gaming System goes offline and the minimum regulatory RTP cannot be met.

5.9 Gaming System Risk / Threat Assessment

Gaming Systems dealing with high prize amounts (typically greater than \$100,000) have generally high level of operating risk. The operator must carry out a risk assessment of such Gaming Systems including any security vulnerabilities, attack risks and corresponding preventative measures. The risk assessment must assume the attackers have full knowledge of how the system operates.

This risk assessment must include (but is not limited to):

- Internal threats e.g. operator and authorised personnel with physical and virtual access to gaming systems, design engineers, programmers, all persons with access to source code, etc.
- External threats e.g. general public, gaming venue employees, ex-employees and OLGR Officers.

Internal threats must be weighted significantly higher than external threats. An appropriate risk assessment report may be required as part of submission to OLGR.

5.10 All artwork (including animations, pictures – static & electronic) in the Gaming System must be approved.

5.11 It is OLGR policy that Gaming Systems games / prizes must not have a component of skill in the form of physical dexterity. Contact the OLGR in regard to the suitability of prizes with elements of strategic skill.

5.12 In Gaming Systems where the BTs can remain in play when a particular linked prize has been disabled (i.e. minimum regulatory RTP is still being achieved), the Gaming System must clearly indicate to the players that the BTs are not participating in the linked prize so that the players are aware that there is a reduced RTP. This may be accomplished by displaying “Jackpot is unavailable” or similar message on the Jackpot Display System.

5.13 Upon a WA prize being won, all other participating gaming venues and players must be informed of which venue has won via the jackpot display system or BT's display. The message must remain on the display for at least 24 hours or until the next hit of the WA prize in that group. This is to allow adequate time for the win to be displayed to a wide audience, especially in the case of a win just before a gaming venue ceases gaming for the day.

5.14 Communications

All electronic communications occurring between components of a Gaming System must have some form of acceptable error detection and error recovery capability. The minimum acceptable error detection algorithm quality is a 16 bit CRC.

5.15 Communications – security

In Gaming Systems requiring a high degree of security, such as Gaming Systems with prizes or progressive prize ceilings more than \$250,000, or with a high level of operating risk, some form of authentication system may be mandated by the OLGR on critical communications in the Gaming System. This is at the discretion of the OLGR.

- 5.16** At all times, it must not be confusing to a player as to what prizes/jackpots they are eligible for and participating in. Also, and equally important, it must be clear to a player what prizes they are not currently eligible for and not participating in. This is a design/operational requirement to avoid player confusion and disputes.

6 Gaming System Reconciliation/Auditing

- 6.1** All Gaming Systems must be auditable.

The Gaming System must maintain complete audit trails, event logs and accounting meters for each physical component in the system. It must be possible to reconcile meters between each discrete physical component in the Gaming System.

- 6.2** All Gaming System current prize amounts must be fully reconcilable from meters stored in the Gaming System for each accounting period (e.g. BT contribution meters, hits and wins per BT, per level etc.).

- 6.3** Reporting

Gaming venues with third party REGULATORY Gaming Systems must be given once per month and upon request, reports detailing information which allows the venue to:

- 6.3.1 Reconcile each prize's current amount with individual Gaming System meters per BT (i.e. turnover/contribution, hits, wins, etc.). LINKED PROGRESSIVE only.
- 6.3.2 Reconcile every hand paid prize for the venue with its corresponding event in the Gaming System. (Like an event report but it must be totalled.)
- 6.3.3 Reconcile per prize level, total auto-paid prizes and total hand paid prizes with total prize wins

- 6.4** For REGULATORY Gaming Systems, all parameters, audit trails, variables and events relating to the current prize amounts must be backed up in the Gaming System at least once every 24 hours. Backups must be stored off site.

- 6.5** For REGULATORY Gaming Systems, all parameters, audit trails, variables and events relating to the current prize amounts must be stored on-line in the Gaming System for at least the last 3 months of data. This information must be treated as a business record.

- 6.6** Audit interface

REGULATORY BTs, PTDs and PTs must have an auditing user interface.

- 6.7** When an audit interfaces in the Gaming System, it must be easily verifiable that the data is coming directly from the intended device and not some other source. (Easy if it is a built-in interface otherwise some form of authentication (e.g. x509 certificates or similar) must be in

use).

- 6.8** In systems which trigger prizes based on BT contributions, it must be possible to reconcile contributions from each BT with total contributions with the corresponding PTD via the audit interfaces on the devices.
- 6.9** In the Gaming System, if the Prize Totaliser and PTD are not the same physical device, then it must be possible to reconcile contributions received between the two devices via the audit interfaces on each of the devices, or some other convenient auditing interface within the Gaming System.
- 6.10** In support of section 6.2, as an example, at least the following information must be retrievable from the Gaming System upon request on the audit interfaces of the BTs/PTs/PTDs (where applicable):

Per Gaming System:

- 6.10.1 The current date and time. (Applies to all Gaming System components individually)
- 6.10.2 The total number of BTs enrolled on a level (per PTD).
- 6.10.3 The total number of BTs enrolled on prizes under the PTD per venue (if applicable).
- 6.10.4 (PTD only) The current calculated PTD program hash value for an arbitrarily entered seed. The hash algorithm must be secure.
- 6.10.5 Everything else below should also be assessable from the Gaming System host.

Per prize level per Prize Totaliser and PTD (as applicable):

- 6.10.6 Level name, number and ID
- 6.10.7 Level creation/last change date and time
- 6.10.8 Total turnover and total contributions (2 meters)
- 6.10.9 Total turnover and total contribution since last prize hit (2 meters)
- 6.10.10 Total hits
- 6.10.11 Total wins (mandatory in Prize Totalisers only)
- 6.10.12 Total ECT and ECT threshold (if applicable on the Prize Totaliser)
- 6.10.13 Total simultaneous wins & overpay meter (if applicable on the Prize Totaliser)
- 6.10.14 Prize current amount (Prize Totaliser only)
- 6.10.15 All prize parameters, for example:

- Start-up (in \$) (Prize Totaliser only),
- Ceiling (in \$) (Prize Totaliser only),
- Percentage Increment (%) (Prize Totaliser only),
- Probability of a hit per unit bet (show units), or
- Average Contribution to Trigger (ACT) in \$ (preferred value to display for fixed prizes), or
- Theoretical Average Trigger Value (ATV) in \$. (Preferred value to use for progressive prizes. This is a more intuitive value to display than probability and also avoids having to display fractions. NB ATV is not acceptable for fixed prizes.) (PTD only.)

6.10.16 Event details of at least the last five hits of each prize level.

6.10.17 The current total number of current BTs enrolled on the level.

The Gaming System must use the above parameters to ensure the current number of BTs stays within approved limits. Also see sections 14.7 & 14.8

Per prize level per Prize Totaliser and PTD (as applicable):

6.10.18 BT serial number

6.10.19 BT floor ID / location ID

6.10.20 Total turnover and total contributions (2 meters), total hits and total wins.

6.11 In a REGULATORY Gaming System, the information listed in 6.10 must be stored in the Gaming System host computer. This must automatically be done on a daily basis, upon level deletion and upon request. The information must have a date and time stamp.

6.12 For a REGULATORY Gaming System, all Gaming System reporting must be available to OLGR via remote access on demand.

6.13 Meter Rollover.

In any Gaming System, the total turnover meters, total contributions meter and total wins meters are the most likely meters to rollover (in that order). Meters in the Gaming System must be of sufficient size to avoid rolling over during the expected life of any prize on the Gaming System.

6.14 Prize Totalisers must perform a self-audit check (reconcile contributions and other meters against current prize values) upon:

- every restart of the device and before commencing operation,
- prior awarding any prize and
- at least once during each hour of operation.

If a self-audit error is found, the device must disable operations. Events must be logged.

7 Prizes with Deterministic Triggering Algorithms

This section deals with the strict limitations and requirements that apply to prizes with deterministic triggering algorithmsⁱ.

In some older OLGR publications, prizes with deterministic triggering algorithms have been referred to as “Deterministic Jackpots”

- 7.1** There must be adequate security arrangements in place to ensure the orderly and proper conduct of players and spectators. Syndicated play attacks being the concern here.
- 7.2** For prizes with DETERMINISTIC triggering algorithms, the trigger must be set randomly and must have an equal probability of being set at any value between the fixed start up amount and the fixed ceiling amount.
- 7.3** It must be extremely difficult, cost wise (well in excess of the prize ceiling) given full knowledge of the Gaming System to extract, change or compromise the trigger value of a prize with a deterministic triggering algorithm, without a major exception event being generated in the Gaming System and the PTD becoming permanently disabled until manually reset.
- 7.4** PTDs operating prizes with deterministic triggering algorithms must protect the prize trigger variables by recalculating the appropriate trigger variables (i.e. pick a new trigger value in the range of the current prize amount and the ceiling amount) if it detects its security is compromised in any way. This must be done after every detected PTD cabinet access.
- 7.5** Prizes with deterministic triggering algorithms must be restricted to a single venue. No multi-venue prizes of this type will be approved by the OLGR.

8 Contributions

Contributions in a Gaming System are created by players making bets via a ‘Betting Terminal’ (see below).

Contributions have two primary destinations in a Gaming System: firstly, contributions which go towards current prize amounts with respect to progressive prizes (i.e. a percentage of contribution is taken and added to participating current prize amounts), and secondly, contributions which go towards a chance of winning (i.e. a contribution buys a proportionate chance of winning in the prize triggering algorithm). In a WA linked progressive there is also contributions to fund fixed prize components (start-up amounts).

The intent of the requirements in this section is to protect and preserve the integrity of contributions as player funds, protect the Gaming System from malfunctions that result from corrupt or erroneous contributions and from contribution type attacks (i.e. an attempt to buy the prize by injecting large contributions into the Gaming System).

ⁱ Prizes with deterministic triggering algorithms have been demonstrated to cause frenzied play and stand over tactics when prizes near ceiling values.

8.1 Contributions created in a Gaming system must be managed, moved and stored in a fault tolerant manner.

This may involve CRCs, error checking, error correction, message / packet loss protection, redundancy, reliable protocols, and on multiple levels, depending on system architecture at a level commensurate to the level of operating risk (max prize and turnover) of the Gaming System.

At a minimum, any single point of failure scenario which results in a loss or duplication of a contribution in the Gaming System will be deemed an issue.

8.2 Continuous vs Discrete Contributions

There are two high level approaches to moving a contribution amount through a system; by discrete amounts or continuous amounts. E.g. for a BT on a linked prize (with a total turnover of \$1234) which plays 5 games at \$1 each, discrete contributions would be of the form of five messages containing amounts of; 1, 1, 1, 1 & 1. Continuous contributions would be of the form of up to five messages containing amounts of 1234, 1235, 1236, 1237 & 1238.

Continuous contributions can inherently recover from packet loss. However discrete contributions cannot.

Accordingly, if discrete contribution packets are implemented, then they must also be accompanied by a sequence number to protect against packet loss.

8.3 Contribution sanity checks and limits.

Sanity tests must be applied to all contribution amounts in a Gaming System every time they are passed between functions, modules or devices.

The sanity threshold values of contributions must be as small as possible without inadvertently creating exceptions. The limits must be set dynamically proportional to the number of Betting Terminals and take into account communication timeouts and latency.

The contribution sanity tests must all be described in the submission documentation (Refer 4.8).

8.4 Security of sanity threshold values adjustments.

Where manual adjustments of sanity threshold values are possible (i.e. limits should not be hard coded), the Gaming System operator's internal controls, or the Gaming System must provide adequate security to ensure the limits can only be changed by authorised personnel and confirmed before saving. All adjustments of sanity threshold values and methods must be first approved in writing by OLGR. All manual adjustments to sanity threshold values must result in an event in the Gaming System with full details.

8.5 Contributions failing any sanity check must not contribute to any prize's current amount or chance of winning etc.

8.6 For auditing purposes in REGULATORY Gaming Systems, any contributions failing a sanity check must result in an event with full details.

The event must contain at least the following information:

- A date and time stamp
- Betting Terminal/Totaliser ID (if more than one in the Gaming System, as applicable)
- PTD ID (if more than one in the Gaming System)
- Linked Group/Pool ID
- Prize level ID (if applicable)
- Amount of the invalid contribution
- Current value of prize/level contribution meter

8.7 All invalid contribution events must be investigated for the probable cause within 24 hours of the event by the operator. Upon investigation if the contribution was actually found to be valid, then the applicable prize amounts must be manually adjusted upwards by the excluded contribution amount.

8.8 For regulatory and gaming taxation purposes in a wide area REGULATORY Gaming System, each participating gaming venue's contributions must be monitored individually by the Gaming System.

8.9 Overflow

When a prize reaches its ceiling, additional prize contributions go to an overflow meter. Contents of the overflow meter are automatically added onto the prize's current amount once the amount falls back below the ceiling subsequent to a win.

The approved prize RTP must reflect the overflow management.

For auditing purposes, all prize contributions when the jackpot is at its ceiling must still be totalled per prize level and stored by the Gaming System for the duration of the life of the prize level.

8.10 Post Draw Close Attacks.

In Gaming Systems where Post Draw Close Attacks are determined to be an applicable risk, the Gaming System must be designed to eliminate or reduce this risk to a level that is acceptable to the OLGR.

8.11 Pre Draw Close Attacks and Draw Substitution Attacks

An example of a pre draw close attack would be where the draw is covertly conducted prior

to close of betting and then used at the official draw outcome once betting has closed. The attackers make an ordinary bet on the pending draw outcome which is known to them.

A Draw substitution attack is simply where the draw results are substituted or altered during the draw process in order to match a specific bet or bets made by the attackers.

In Gaming Systems where these types of attacks are determined to be an applicable risk, the Gaming System must be designed to eliminate or reduce this risk to a level that is acceptable to OLGR.

9 Triggering Methodologies

9.1 REGULATORY Gaming Systems where the trigger probability is primarily proportional to time will not be considered for approval at this time.

9.2 Gaming Systems where the trigger probability is primarily proportional to BT turnover are acceptable (and are the most common Gaming Systems).

9.3 Prize triggering methodologies will be considered upon application. Approval is at the discretion of the Executive Director, OLGR. All prize triggering methodologies must be reliable, secure, random and fair to the player.

9.4 All eligible players of a prize, who are betting equal amounts towards the prize, must have an equally likely chance of winning the prize at all times.

In other words, the probability per dollar bet of winning a particular prize level must be the same for all BTs on the prize level.

9.5 Players who are contributing to a prize's current value must be eligible to win the prize i.e. once a contribution has been created by a BT, a player must receive a corresponding chance of winning the prize and within a reasonable time (e.g. on a gaming machine, before the end of each play).

9.6 A player's chance of winning the prize must be in proportion to their contribution (or bet) to the prize..

9.7 Once a prize contribution has been created by a BT, the Gaming System must never allow that BT's corresponding chance of winning to be lost or given to another BT, even in the event of a power failure or a communication problem in the system. Exemption for this requirement may be granted in the case where all players benefit equally from the behaviour (in proportion to their contributions).

9.8 A BT which is not contributing towards a prize amount must not receive a chance to win the prize.

9.9 In a REGULATORY Gaming System, the outcome of a prize hit evaluation where possible should not be determined until a corresponding valid bet/contribution has been received by the PTD. Reason: security is easier to achieve.

9.10 In some Gaming Systems it may be possible to trigger more than one prize on any given play. If this is possible, describe in the Gaming System submission how this occurs and how it is handled. The Gaming Systems handling of this scenario must be fair and readily understood by players.

9.11 Deferred Wins

Under some rare conditions (refer 9.10 & 11.8.6) it may be acceptable for the PTD to defer awarding a triggered prize until the next play on the same BT. Deferring awarding of a prize is only acceptable under the following conditions:

- All effort is made to minimise the chance of a deferred win condition occurring in the

first place. Deferring a win must be a last resort.

- The deferred win must be kept secret by the PTD and internal to the PTD.
- There is no way to ascertain that the PTD has a deferred win pending without accessing the tamper sealed compartment on the PTD. Even if the PTD is accessed, there still must be no easy provision to find out if a win is being deferred e.g. such as a debug output or test mode.
- All players benefit equally from the behaviour (in proportion to their contributions)

9.12 Insider Knowledge

Where knowledge of an Gaming Systems triggering methodology or other aspect of the Gaming System could give a person any advantage over other players (in terms of RTP) and the knowledge cannot be intuitively understood from observing play on the Gaming System, then the triggering methodology (or knowledge) and associated rules for the Gaming System must be publicly displayed in plain English on each jackpot display system in the Gaming System.

10 Prize Triggering Devices (PTDs)

The majority of the security and integrity requirements are placed on the PTDs, because by definition, it is these devices which trigger the prizes and also decide which BTs the prizes are awarded to i.e. they create money from the process of triggering wins and decide who gets it. Therefore, PTDs are the most critical component of any Gaming System.

10.1 All REGULATORY PTDs must be clearly and indelibly labelled with the following information:

- REGULATORY PRIZE TRIGGERING DEVICE
- Manufacturer name
- Model name
- Part Number
- Serial Number
- Date of Manufacture

10.2 All PTDs must be readily accessible (no tools/disassembly required) to allow for the easy inspection of its tamper seals.

10.3 Upon commissioning, all REGULATORY PTDs must be tamper sealed by a trusted party which preferably is not the Gaming System operator or Gaming System developer (e.g. licensed repairer or an OLGR inspector).

Note: OLGR approved cable-tie seals currently require 6x3mm holes, but adhesive tamper seal tape is also available. A document of approved tamper seals is published on the OLGR website.

10.4 DELETED

10.5 A REGULATORY PTD's program signatures must be able to be verified on the audit interface of the PTD on demand.

10.6 DELETED

10.7 REGULATORY PTDs must be monitored by a host system which allows remote verification of PTD software.

10.8 It is preferred that PTDs are as dedicated solely to the function of triggering prizes as possible. Intent: a PTD which is a part of a multi-purpose device may lengthen the evaluation time as complex or multi-role systems require more work to evaluate and ascertain security.

10.9 Remotely Reprogrammable PTDs

If the use of tamper seals on PTDs is required (see 10.3), a PTD must not have downloadable software capability without first having to access the tamper sealed compartment of the device. Exceptions: PTDs which implement the requirements outlined in OLGR technical requirements document titled "Electronic Seal Minimum Requirements" and also has implemented a multi-signatory Public Key Encryption authentication system for upgrades (or the equivalent) to the OLGR's satisfaction.

10.10 High Risk PTDs

PTDs deemed high risk must implement the requirements outlined in OLGR technical requirements document titled "Electronic Seal Minimum Requirements".

For the highest security possible, PTDs operating prizes or ceilings in excess of \$250,000 must be completely sealed. This means no ventilation holes or sockets are allowed. One protruding cable for interfacing and power is acceptable. The device once manufactured must have no provision to be opened. The device must be water resistant. For identification purposes, the device must still have provision for a physical seal.

Exemption: Multi-venue Gaming Systems with a single centralised PTD located in a secure restricted area.

10.11 PTDs operating in high risk conditions (prizes or ceilings in excess of \$250,000) must use a strong public key encryption algorithm to digitally sign LINKED prize award events/messages. Refer 11.4.

- 10.12** Every REGULATORY PTD software submission must contain full source code, compiler and building instructions. The source code must be able to be compiled and the resultant object code must then be able to be verified* with production devices (refer 4.14).

The software submission must also contain comprehensive compilation and verification procedures.

*either by direct comparison or using the SHA1 or better hashing algorithm

- 10.13** All Random Number Generators and associated software must comply with the OLGR Minimum Requirements document for Random Number Generators.

- 10.14** If the PTD and RNG are separate physical devices then there must be a secure methodology in place where by the PTD will only accept draws from a specific RNG e.g. digital signatures, encryption and authentication.

- 10.15** The PTD must implement and store a NV event log that logs all significant events such as all linked prize wins with details (Refer 11.3) and all prize level parameter changes with full details. The event log must not be able to be purged but the PTD may overwrite old events with new events as they are generated. For PTDs operating at high risk levels, it may be prudent to implement a dedicated event log for some critical event types in order to lower risk further.

- 10.16** The PTD must implement integrity checks on its internal jackpot related event queues which are equivalent to or better than a 32 bit CRC. (For efficiency, consider having an individual CRC on each event and the event queue header rather than a single global queue CRC.) Event queue integrity checks must be performed upon each restart of the device. Any corruption that is unable to be repaired must halt the device.

10.17 Critical Memory Error Detection

- 10.17.1 The PTD must have a general error detection methodology operating on all other critical data (such as parameters and RNG states and meters) stored in its NV-RAM. The critical data must be either CRC protected or verified against multiple inverted copies of data or better algorithm.

- 10.17.2 PTD NV-RAM integrity and critical data must be verified upon every power up or restart of the PTD software.

- 10.17.3 A PTD must test its program for possible corruption upon every power up comparing it with a previously saved or hard-coded program hash value. The hash algorithm must be secure.

10.18 PTD Program Verification (REGULATORY PTDs only)

It must be possible to isolate the PTD's program storage devices (PSDs) for the purpose of verifying the contents by comparison with a known good copy. This requires the PTD's PSDs be socketed (or the equivalent) for easy removal. Physical access to the PSDs must only be possible by breaking the tamper seal on the PTD.

Submission requirement section 4.14 relates to any hardware and software needed to undertake program storage device verification according to this requirement.

10.19 In a Gaming System where the BT(s) and PTD(s) are physically separate devices, there must be at least two separate display devices that display win notification messages to the winning players. At least one of these display devices must also have an associated means of producing an audible sound or fanfare to attract attention to the win.

This requirement is to help reduce the risk of a player walk-away in the event of a single jackpot display failure (Refer 11.8).

10.20 PTDs must be protected from electrical power fluctuations and disturbances such as power surges and lightning strikes.

10.21 PTDs with prizes or ceilings in excess of \$100,000 may not be RAM cleared without prior approval from OLGR.

11 Awarding Prizes

11.1 All REGULATORY prizes won which may be either hand paid or electronically transferred to a BT, must result in an event in the Gaming System.

11.2 PTDs that are a part of a linked jackpot arrangement must log an NV event upon each trigger of a jackpot prize. The last 10 jackpot events per prize level must be retrievable on demand from the awarding PTDs.

11.3 Win Event Data.

For auditing purposes, each REGULATORY prize win event must contain at least the following information (as applicable):

11.3.1 A date and time stamp.

11.3.2 PTD device ID (if more than one exists in the Gaming System).

11.3.3 Linked Group/Pool ID (if more than one exists in the Gaming System)

11.3.4 Level ID (if more than one exists).

- 11.3.5 Amount of the prize won.
- 11.3.6 Prize Totaliser device ID (where different from the PTD ID)
- 11.3.7 The amount of the bet associated with the contribution that triggered the prize.
- 11.3.8 PTD total hits for level (including this one). Effectively this field when combined with PTD, Group and level IDs, should represent a unique serial number for the win event since last RAM clear of the PTD. (This allows for easier duplication checks to be performed as opposed to using time-stamps which are often unreliable).

For linked jackpot arrangements this field must be used by the Gaming System to ensure each jackpot event is only acted upon once. There must be no single point of failure scenario in the Gaming System whereby the system could process the same jackpot event twice as two separate jackpots.

- 11.3.9 The results of the draw (e.g. the winning numbers)

This is only applicable to Gaming Systems where the draw result is published and the result contains more information than just win or lose.

- 11.3.10 Theoretical probability of the prize

This item is only mandatory in Gaming Systems where the triggering probability is not hard-coded into the PTD, or if 11.3.9 does not already apply.

Avoid representing this value as an ATV as this does not handle fixed prizes. When representing as a raw probability (p), units must be always indicated and a high precision number format must be used.

- 11.3.11 Secure Hash Value of applicable bets

If a Gaming System is of the type at risk from Post Draw Close Attacks, has prizes or ceiling above \$250,000 and the PTD is a separate device from the BT(s), then the PTD must also include an acceptable Secure Hash Value (or the equivalent), of all 'bet details' pertaining to the draw that triggered the award.

The 'Bet details' must contain enough information to establish at least the following (where applicable):

- what draw and outcome(s) were bet on;
- the owner or BT ID number of the bet and how much was bet.

The hash value must be verified for all prizes won deemed as 'large wins'. The verification must entail a recalculation of the hash value to be the same as the original. The verification must also check that the winning bet was actually in the bets pertaining to the hash value.

- 11.4** When required to do so (refer 10.11), prize won event and associated information required in 11.3 above may be required to be signed by the PTD with a secure digital signature. The

signature must be created by the PTD using an algorithm and methodology that is secure and acceptable to the OLGR. The signatures on prize won events must be automatically authenticated by the Prize Totaliser and Gaming System host, as well as be manually verified for all prizes deemed as 'large wins'. A failure of any prize won event signature to authenticate must automatically disable the Gaming System.

11.5 Prize Win Notification

It must be automatically clear to a player upon winning a prize that they have won the prize and which prize level they have won. Both visual and audible notification of the win must be given to the winning player. It is recommended the Gaming System disable play on the winning players BT for a sufficient length time for the player to understand the win, sound a fanfare and display a win message on the BT (if possible) and jackpot display system. The win notification prominence should be scaled with respect to the risk of walkaways.

- 11.6** When a prize is triggered in a Gaming System, the process of the PTD notifying the winning player is considered critical. Where the PTD is detached from the device that notifies the winning player of the prize (i.e. the PTD is not a part of a BT or a Jackpot Display) then there is the possibility that the win notification may not reach the winning player.

Accordingly, to minimise the risk of losing win notifications, every stage through which the win notification is transferred, must be protected using error detection, error recovery, state recovery and be fully fault tolerant.

- 11.7** If the Gaming System has a jackpot display system with one or more dedicated jackpot displays, a loss of communications with the winning BT at the time of a prize win or at any stage within the Gaming System, must not delay the prize won from being awarded via the jackpot display system if this is still possible.

11.8 Walkaways

Refer section 2 for definition of the term "Walkaway".

The risk of walkaways is common to gaming systems arrangements where for example mystery jackpots prizes are run on top of EGMs. In these scenarios the play on the EGM will not wait for a response for the mystery jackpot system before finalising the play.

The 'Walkaway Period' is defined as the period of time starting the instant a play is completed on a BT that results in the credit meter going to zero, until the time the Gaming System visibly awards any prizes which may have occurred as a result of the last play's contribution.

During the Walkaway Period it is possible that the player may leave the BT before a win from their last contribution has been awarded. Note, as stated in the definition, it is assumed a player will not leave a BT with credit still on it.

Where Walkaways are possible in the Gaming System, then the Gaming System must be designed with the following considerations:

- 11.8.1 Walkaway periods that exceed 30 seconds are not acceptable.

- 11.8.2 All effort is made in the Gaming System design to minimise the walkaway period.

- 11.8.3 The Gaming System must have provision that prevents the system from awarding prizes to a BT that no longer has a player in attendance. (For EGMS, it may be assumed a non-zero credit meter is evidence of a player in attendance and that a player is still in attendance for six (6) seconds after the credit meter has been detected via the EGM protocol to have just gone to zero). See also 4.9.

- 11.8.4 If a Gaming System or operator thereof detects it has lost the ability to notify one or more participating players that a win has occurred, then all affected BTs must be disabled (disabling must be automatic for issues detectable by the system e.g. a communications problem). Alternatively, the affected Gaming Systems must be taken offline. The intent is to avoid walkaways.

- 11.8.5 Deferred Contributions. It is acceptable for a player's chance of winning to be passed on to the next play of the same BT (even though this may be a new player). This is acceptable on the condition that all players have an equally likely chance of benefiting from this behaviour and the behaviour cannot be exploited for an advantage.

- 11.8.6 Deferred Wins. As a last resort, it is acceptable in the case where the PTD is very slow to evaluate a contribution for a win, for the PTD to defer the win to the next play on the same BT. Refer to section 9.11 for further requirements in this regard.

- 11.8.7 If a significant walkaway period exists in a Gaming System then a statement which indicates that players are eligible to win a prize for X seconds after the last game is played must be included on the BT artwork. For example, a scrolling message displayed via the jackpot display system, or a simple sticker prominently displayed on each BT. Note that all Gaming System artwork must be approved by OLGR.

- 11.8.8 Identifying the winning player of a walkaway

If a walkaway does occur, all attempts must be made to identify the winning player. E.g. use the player loyalty system event log if present, or video surveillance if present. If the winning player still cannot be identified then the amount must be referred to the Chief Executive, OLGR for action.

In some cases it may be possible to add the amount back into the Gaming System, or to another suitable Gaming System operating at the gaming venue as a positive adjustment.

11.8.9 All walkaway incidents must be reported to OLGR (operational reporting requirement)

11.9 To ensure winning players are clearly identified in large jackpots, Gaming System with prizes or ceilings exceeding \$100,000 must have video surveillance of all participating BTs (operating while the jackpot is active), or a player loyalty system which records player identity with respect to BT during play, and which prevents play on the BTs on the jackpot until a recognised valid player loyalty card is inserted. This requirement is applicable only in Gaming Systems that do not issue tickets or receipts for bets made.

11.10 No re-picking

If a walkaway, power fail or similar event occurs just before the Gaming System could award a prize to a winning BT, then the Gaming System must still proceed and award the prize to the same BT immediately after coming back on-line. Re-picking of another in-play BT is not allowed as this functionality is considered a potential security risk.

11.11 Deleted.

11.12 Prize Fanfare Sounds

For all manually paid prizes, when a prize win occurs, the Gaming System must prominently sound an audible fanfare to the winning player. The volume of the fanfare must not be able to be turned completely off and its volume must be able to be adjusted separately from all other sounds such as attract mode sounds. At its lowest volume level, the fanfare must still be clearly audible to the winning player.

11.13 Prize Abatement

It is OLGR policy that abatement of prizes won is not allowed except in the case of a simultaneous win in a multi-PTD LINKED PROGRESSIVE Gaming System. Refer to section 13 for more information on simultaneous wins.

11.14 Prize payment by annuity is restricted

It is OLGR policy that jackpot / prizes are to be paid in full at one time and not by way of annuity.

11.15 If an EGM can operate a PROMOTIONAL prize (i.e. the EGM is the PTD or Prize Totaliser for the promotion), the EGM must clearly segregate the promotion's meters and data from all other meters and accounting information. Promotional meters and data must not be added to any other meters on an EGM.

In general, PROMOTIONAL prize accounting information must be segregated from REGULATORY prize accounting information and meters.

- 11.16** In EGM related Gaming Systems, it is OLGR policy that PROMOTIONAL prize wins must not be transferred to the EGM's credit meter.

12 Authentication of Jackpots and Prizes

- 12.1** The amount of authentication and checks concerning a jackpot or win must be in reasonable proportion to the level of operating risk (typically this is linked to the amount of monies involved).
- 12.2** The Gaming System operator's internal controls / procedures must provide adequate protection to minimise the risk of fraud. OLGR may audit this as part of its venue and operator audits.
- 12.3** For every prize won that is greater than \$100,000, authentication of the PTD by the party who sealed the device at the Gaming System operator's expense is required. The authentication should entail an inspection of the Prize Triggering Device's physical tamper seals, a verification of the win event and Digital Signature (if present) and depending on the level of security and risk involved, a local verification* of the PTD program and contents.

* Where digital certificates, authentication and electronic seals are not in use, the PTDs Program Storage Devices (PSDs) must be inspected to ensure they are the correct size and a local authentication/signature algorithm must be applied to its contents. A bit to bit comparison with a known good copy is preferred. However, if the PTD tamper seals are intact then it may be acceptable for the device to be authenticated by displaying a calculated secure hash value for an arbitrary entered seed.

13 Simultaneous Wins

Simultaneous wins are inherent to LINKED PROGRESSIVE prizes. This section is concerned with the options available to an operator when a simultaneous win occurs.

Under these requirements, a simultaneous win of concern is defined to have occurred in the following scenario:

There exist multiple BTs in a linked prize arrangement and one player receives notification of a specific prize won by their BT (via a win message or display of a winning combination), but before the current progressive prize amount/s displayed to all other participating players could be reset to their next start-up values, notification of a win for the same prize level occurs on one or more additional participating BTs.

- 13.1** There are three available options for handling simultaneous win payouts:
1. Some Queensland Legislation allows a simultaneously won prize to be shared between all eligible winners.

This means that when a prize amount is shared, each eligible winner must receive the full start-up amount plus an equal share of the remaining prize contribution. For example, if the prize Start-up is \$10,000 the displayed prize current amount is \$19,000 and three players won the prize simultaneously, each player would get \$13,000.

This option requires manual payments in order to also explain the winning amounts to the recipient players.

2. Pay all eligible winners in full.

This is generally feasible because simultaneous wins are fairly low probability to begin with and become exponentially improbable with higher prize amounts, the effect on the RTP from paying out simultaneous wins in full to all eligible players is quite negligible. (It also makes no difference with respect to the RTP whether the prize was large or small.)

This option is the simplest to implement (and therefore can be easily automated) but it does require a record (i.e. meter) to be kept of the overpayments in order to still be able to audit/reconcile the prize current amount from other meters.

If there is enough money in the prize level's overflow meter to pay all eligible winners then this option should be mandatory.

3. A third option exists which is to argue that there are no simultaneous wins and thus pay the first eligible winner the full Prize value and subsequent eligible winners are only paid the level's start-up amount.

This option can lead to disgruntled players and is least preferable. One method of minimising risk here is to explain the procedure in the event of simultaneous winners in the Gaming System's artwork and/or in its Terms and Conditions.

13.2 OLGR policy: Simultaneous wins may not be auto-paid by the Gaming System unless the system is paying all winners in full. This is because players deserve an explanation if any other option other than "pay-all in full" is chosen.

13.3 The Gaming System must detect and record (as events and meter the number of) all occurrences of "simultaneous wins". When paying-all in full, the system must also record the amount of over-payment which occurs as a result of this option.

13.4 To minimise the probability of a simultaneous win, the system must give the highest priority to resetting applicable prize current amounts throughout the network after a win occurs. Latency times in this regard will be deemed acceptable at the discretion of the Executive Director, OLGR.

13.5 The Gaming System operator must notify the players affected and venue staff giving an explanation and details if a PROGRESSIVE LP prize is to be shared.

- 13.6** If a simultaneous win not paid in full to all eligible players (option 2 above), full details of the incident must be submitted in to the OLGR.

14 Prize Parameters

Parameters dealt with in this section pertain primarily to prize level parameters that can affect the percentage Return to Player of prizes in the Gaming System. For example, in a vanilla progressive prize, prize parameters refer to the percentage increment, start-up amount and trigger probability. (Ceilings are of no major concern so long as they are set reasonably, as they do not affect the RTP of the Gaming System.)

14.1 Frequency of Prize Parameter changes

Gaming System operators are typically only permitted to change the RTP of a BT participating in any REGULATORY Gaming System no sooner than one month (28 days) since the last change to the BT's RTP. (This is as per changing the RTP of an EGM as stated in the machine gaming regulation.)

- 14.2** In a REGULATORY Gaming System, all parameter changes must be fully tracked via an audit trail.

- 14.3** The above audit trail in the Gaming System must be stored and backed up daily.

- 14.4** Any changes to REGULATORY prize parameters must be via secure access and must only be possible by authorised personnel. Sufficient consideration must be given to the security of prize parameters in the Gaming System in order to prevent attacks related to the manipulation of prize parameters.

- 14.5** All REGULATORY prize parameters must be approved before use by the OLGR.

- 14.6** Prize hit rates must be reasonable and suitable for the given number of BTs, see below.

14.7 Prize Oversubscription

One example of how to handle a prize oversubscription that maintains a consistent theoretical RTP (even with ongoing oversubscription), is to take the amount of overflowing contribution and to give it its own chance to award a proportional number of additional start-up amounts to be paid out on a single trigger. This approach works well for stand alone prizes but may not be feasible in all types of linked prize arrangements; in which case, prize oversubscription is simply best avoided by design.

- 14.8** To ensure a proper audit trail is generated concerning REGULATORY prize parameter changes, changes must be performed via a deletion/creation operation of the prize levels or an equivalent process.

The intent here is that this process will ensure all last known prize level variables and meters will be saved as records in the Gaming System and allow all necessary audits and calculations to be performed, e.g. of wins owing.

14.9 Enrolment Auditing

This requirement is applicable to Gaming Systems whose prizes are awarded or displayed via BTs or jackpot display system where the BTs are not inherently aware of their enrolment in a given Gaming System e.g. the enrolment of EGMs in external prizes which are not an inherent part of the game programmed into the EGM.

The intent of this requirement (below) is to help minimise the risk of the following scenarios as applicable:

- Failure to enrol a BT in a linked jackpot / prize intended to be enrolled
- Enrolling an incorrect BT in a linked jackpot / prize.
- A mismatch of BT with Jackpot Display or vice versa causing a prize to be awarded to the wrong BT or jackpot display system
- No readily available ability to easily confirm if a BT/Jackpot Display System is enrolled or not on any given linked jackpot / prize

Each BT and stand-alone jackpot display must have some sort of a display, audit, or diagnostic mode, available at any time, which allows each device's enrolment status (i.e. 'Is enrolled' and ID) to be displayed, allowing visual confirmation of jackpot enrolment status and partnership details (if any).

14.10 Progressive Prize Ceilings

Progressive Prize Ceilings are mandatory on all progressive prizes to the constraints defined in this document.

All progressive prize level parameters must be approved with sensible prize ceilings applied to the current prize amount by the prize totaliser. The intent is that progressive prize ceilings achieve a number of benefits when compared to progressive prizes with no ceilings:

- Prevents (or caps) potentially misleading advertising of overly improbable or unrealistic prize values.
- Implements an RTP cap on the prize which, if set less than the break-even threshold for the jackpot product as whole, prevents undesirable player behaviour if a gaming product ever exceeds 100% RTP at any time during operation.
- Progressive prize ceilings (typically as a result of the inherent way they tend to be implemented in software*) can act as failsafe against any progressive prize corruption. *As ceilings are often implemented towards the final stages of the

progressive prize totalisation routines, any corruption of a progressive prize or totaliser have a chance to be caught and capped by the ceiling limit.

Conversely, ceilings must not be set too low as the prize will constantly be in overflow (i.e. current value will be stuck at ceiling) which basically turns the progressive prize into a fixed prize which is generally not intended / desired behaviour from a progressive prize product.

Rounding of ceiling amounts

The intent here is to avoid ceilings that cause confusion when they are reached because the prize freezes at a figure which is perceived as a strange value. For aesthetic and legibility reasons, the final actual ceilings chosen are the ones rounded as much as possible i.e. as many trailing '0's in the number as possible.

14.11 RTP Constraints

The following requirement is both OLGR policy as well as a prize level parameter sanity check. As a sanity check, it is designed to prevent accidentally entered invalid prize parameters from being accepted by a PTD. It also prevents a Gaming System with remote re-configuration capabilities from being easily compromised (e.g. temporarily adjusting a prize's parameters to make a prize far more probable to win).

- 14.11.1 To prevent unreasonable prize parameters being downloaded into a PTD, either intentionally as an attack or accidentally, all remotely re-configurable PTDs that are also PTs, must be hard-coded to automatically reject any prize configuration which causes the total Gaming System percentage return to player of all levels plus the RTP of the respective BT to exceed 100% endnote Error! Bookmark not defined.. If the PTD is an EGM, then a second RTP limit must also be applied which should equal the MAXRTP of the gaming jurisdiction.

14.12 Ceiling Amount Advertisement

REGULATORY Gaming Systems that advertise the ceilings of prize levels (for the purpose of participation enticement) must publicly display what happens to any progressive prize overflow contributions (e.g. via a statement on the artwork). For example, artwork may contain the statement "Once ceiling is reached contributions are carried over to the next jackpot" or similar

14.13 Formulas

Typical formulas for a 'vanilla' progressive prize level:

Reconciliation formula for a vanilla progressive prize level:

$$\text{Prize Current Amount} + \text{Overflow} = \text{Applicable Turnover} \times \% \text{INC} / 100 + (\text{Hits} + 1) \times \text{Start Up} - \text{Wins} + \text{Initial Contribution (if any)} + \text{Positive Adjustments} - \text{Negative Adjustments} + \text{SimWinOP}$$

$$\text{Total prize \%RTP} = \% \text{Inc} + \text{Start Up RTP}$$

Start Up %RTP = Win Probability x Start Up x 100 = (Hits x Start Up) / Turnover

The **theoretical RTP** for a vanilla progressive prize level may be calculated by:

$$\%RTP = \left(\frac{ATV}{ATV - SUP} \right) \times INC$$

The **win probability** per dollar bet (p) may be calculated by:

$$p = \frac{INC}{100} \times \frac{1}{ATV - SUP}$$

The **Average Trigger Value** (ATV) may be calculated by:

$$ATV = \left(\frac{INC}{100} \times \frac{1}{p} \right) + SUP$$

Therefore:

$$\%RTP = (p \times SUP \times 100) + INC$$

Where:

SUP = Start up Amount in \$

ATV = Theoretical Average Trigger Value in \$ (includes SUP, assumes no ceiling, see above).

Warning: developers should not code ATV as a representation of prize probability (p) into applications. Always use p instead because ATV cannot represent a probability when dealing with prizes with a zero-percentage increment.

INC = Percentage Increment (i.e. 3% means INC = 3)

p = Win probability per dollar bet

SimWinOP = (Simultaneous Win Over Payment) Where simultaneous wins are possible and the system is paying out all eligible winners in full, this term will be required in the reconciliation formula above. SimWinOP is like another type of positive adjustment which is a result of simultaneous wins paid in full. It represents the total accumulated amount added to the CA in order to prevent the prize current amount from dropping below the SUP upon any simultaneous win event.

Notes: It is important to preserve units in all calculations ⁱⁱ

14.14 Linked Jackpot Arrangements (LJA) with the same advertised name, operating within the same gaming venue, must be configured to have the same LJA RTP on each BT that they reside.

ⁱⁱ Units are arbitrary. It is possible to work in units of dollars, cents, or credits, so long as all other variables are in the same units.

14.15 Confirmation and sanity checks on prize parameter changes

To protect against human error, any manual adjustments to a Gaming System's configuration must have at least one level of confirmation and sanity check before the changes are applied. For example:

- Adjustments to a progressive prize's current prize contribution amount. The amount of the adjustment and new prize amount must be acknowledged before the adjustment is applied. A warning must be given if the adjustment causes any overflow (i.e. the prize level ceiling is reached).
- Changes to start-up, increments and trigger probabilities. The Gaming System must calculate and have confirmed the new theoretical RTP and parameters by the user before accepting the change.
- Changes to progressive prize ceilings. The Gaming System must calculate and confirm the ceiling amount before accepting the new ceiling. The lower limit must be strictly applied, however the upper limit if exceeded is a case of an "are you sure?" confirmation.
- Adding and removing BTs. The Gaming System must automatically ensure that any limits placed on the minimum and maximum number of BT are not exceeded.

Any automatic adjustments to Gaming Systems must have similar sanity checks automatically applied by the Gaming System.

15 Decommissioning REGULATORY Jackpots

This section is intended be a guide in relation to decisions made by the CEO, OLGR in regard to the directions concerning disposal of funds from the closure of an approved trust account or jackpot decommissioning.

Definitions:

'Wins owing' is a liability comprised of any contributions in a gaming system already claimed as a gaming tax deduction under a gaming regulation but not yet won or paid. This liability typically occurs in WA linked prizes where a prize is being paid from a third party trust account. Contributions to this liability typically comprise of:

- the percentage RTP of the prize's fixed component (i.e. base or start-up amount) as a percentage of turnover and
- the percentage increment of any progressive component of the prize as a percentage of turnover.

'Current contribution' is defined as the current value of the progressive component of a progressive prize. For example, in a vanilla progressive this is the Current Prize Amountⁱⁱⁱ, less the

ⁱⁱⁱ 'Current Amount': The amount that is paid out if the prize is won at that very instant

prize Start-up amounts plus any Overflow^{iv}. A current contribution may or may not also be a “wins owing” liability depending on the type of jackpot arrangement (i.e. LA or WA).

Intent of any policies contained in this section is to:

- ensure player fairness
- ensure that any wins owing and current contributions from the decommissioning of one prize must not be used to fund a wins owing deficit of another jackpot or prize.
- discourage the decommissioning of a prize simply because it has reached a high threshold, or a trust account value is currently a large surplus.

15.1 DELETED

15.2 DELETED

15.3 Where a gaming venue leaves a multi-venue link, all contributions from players/BTs at that venue up until the venue leaves a multi-venue link, remain in the Gaming System.

15.4 Where a BT is removed from a link, all contributions from the BT simply remain in the Gaming System.

15.5 (OLGR policy) The order of preference for transferring **current contributions** and **wins owing** (if any) as a result from decommissioning a prize is as follows:

1. The contribution must be added to another existing REGULATORY PROGRESSIVE (SAP or LP) within the same gaming venue or operational area if available
2. Where the above is not possible, contributions must be returned to players via gaming related promotional activities within the gaming venue or operational area (the operator is to advise OLGR and obtain written approval for the promotion).
3. Where the above is not possible contribution is forwarded to the Chief Executive OLGR for payment into the consolidated funds.

In cases where the venue becomes insolvent or surrenders/cancels its licence, it may be difficult to invoke any of the above. In such cases, OLGR may have no option but to sanction the extinguishment of the prize liability. However, this will only be considered as a last resort. Note, where a venue surrenders/cancels its licence, it should not be permitted to recommence gaming within 12 months of the date of surrender/cancellation.

NB: Do not transfer amounts from a WA trust account to a LA jackpot pool (i.e. a gaming venue funded prize).

15.6 Decommissioning Examples

Example 1 - Decommissioning a single REGULATORY PROGRESSIVE SAP BT

^{iv} i.e. CA – SUP + OVERFLOW

Assuming a vanilla progressive, the sum of each current progressive prize level amount less the Start-UP amounts (SUP) plus any overflow must be transferred as per section 15.5

i.e. $\text{Sum}_{\text{perLevel}} \text{ of } (\text{CurrentAmount}_n - \text{SUP}_n + \text{Overflow}_n)$

Example 2 - Decommissioning a single REGULATORY PROGRESSIVE LP BT

Contributions are simply left in the Gaming System.

Example 3 - Decommissioning a REGULATORY Local Area PROGRESSIVE LP Prize Level

This example assumes the jackpot operator is also the payer. Then in this case, assuming a vanilla progressive, the current progressive prize level amount less the start-up amounts plus any overflow must be transferred as per section 15.5

i.e. $(\text{CurrentAmount} - \text{SUP} + \text{Overflow})$

Example 4 - Decommissioning a REGULATORY Wide Area PROGRESSIVE LP BT

Contributions are simply left in the Gaming System.

Example 5 - Decommissioning a REGULATORY Wide Area PROGRESSIVE LP Prize Level

In a WA prize level being paid from a trust account, there are typically **two** components (or liabilities) pertaining to a prize level that must be dealt with:

1. Wins Owing pertaining to a fixed prize component

This liability will vary during prize operation from being in **deficit** (the total of all fixed prize components won currently exceeds the total fixed prize contributions received) and in **surplus**.^v (This is why trust accounts initially need seeding^{vi} and the occasional topping up to avoid running dry.)

Upon decommissioning, if wins owing is a **surplus** then this amount will typically be required by the CEO, OLGR as the first preference to be added to the current contribution of another compatible prize^{vii}, or as otherwise as directed by the CEO, OLGR.

The basic formula (i.e. for a vanilla progressive) for calculating this liability is:

$$\text{Liability} = T \times \text{PI}_{\text{SUP}} - \text{SUP} \times \text{Hits}$$

Where:

^v Mathematically this varying liability is referred to as a 'random walk'

^{vi} Seed amounts are only necessary for funding a fixed prize component of a prize, as progressive components of a prize are 1:1 self funding (i.e. 'what goes in is exactly what comes out').

^{vii} Wins owing from a decommissioned trust account funded prize cannot be transferred to a non-trust account funded prize.

T	= total turnover applicable to the prize since inception.
PI _{SUP}	= PRTP of the fixed prize (or start-up amount)
SUP	= Value of the fixed prize (or start-up amount)
Hits	= total prize hits since inception

Simple example: if a level had the state:

Startup amount	= \$10,000
Increment	= 1%
RTP of startup prize	= 0.5%
Current displayed value	= \$17,500 (i.e. turnover = \$750,000)
Hits	= 0
Wins	= \$0

Then the amount (liability) (to be carried over to another WA jackpot) is equal to \$11,250 (i.e. = \$7,500 + 0.5% x \$750,000)

Upon decommissioning, if wins owing is a **deficit** then the amount to be carried over pertaining to the fixed prize component is zero. With no other contingencies in place, this deficit amount would potentially be a loss for the jackpot operator.

It is re-iterated that in order to calculate the correct amount for wins owing, each jackpot / prize level must be calculated individually starting from prize inception.

There is no easy way of getting around the fact that in a WA linked jackpot arrangement, the operator runs the risk that upon decommissioning a prize, the wins owing will be in deficit and therefore they will incur a loss on that prize. *This may be a calculable probably and therefore some form of insurance coverage might be possible.*

2. Wins owing pertaining to the progressive prize component (i.e. **current contribution**)

Fortunately the progressive component of a prize is very straight forward to calculate. For example, for a vanilla progressive prize, wins owing simply equals the 'Prize Level Current Amount' – Startup + Overflow. Basically the rule of money in equals' money out applies with respect to progressive prize components.

Once the wins owing and current contribution of a prize being decommissioned has been determined (see above), this liability must be added as a positive adjustment to the prize amount of another Wide Area PROGRESSIVE LP Gaming System Level. If no other suitable Wide Area PROGRESSIVE LP prize exists then the OLGR will make a direction.

*It should be noted that the amount **cannot** be added to a local area PROGRESSIVE SAP or LP.*

Example 6 - Decommissioning a trust account pertaining to the funding of Wide Area REGULATORY jackpots

Withdrawals from *approved trust accounts* are regulated. Refer to the Gaming Machine Act and associated Regulation for more information.

This is a potentially a very complex scenario and requires significant additional accounting over the life of the trust account in order to solve perfectly^{viii}. The OLGR should be contacted directly in every case of a trust account decommission.

For example, under existing Regulation, a trust account operator may be permitted to recover previous deposits that were made to keep the account solvent. However, unless the account has been managed in such a way that for every prize it has ever been used to fund has been individually totalised against the account with respect to current contribution and wins owing, then theoretically speaking, it is impossible to prove that any withdrawal from a trust account pertaining to previous solvency payments is not actually wins owing in whole or in part.

16 Adjustments

In a progressive Gaming System, the ability to make adjustments to a prize level's current amount is sometimes necessary. An example of a typical use is to add orphaned contributions from other Gaming System levels that have been decommissioned.

16.1 Security

The ability to make adjustments in a Gaming System must be secure and possible by authorised personal only.

16.2 Adjustments to a prize level's current amount must only be facilitated.

To preserve the security and integrity of the Gaming System, prize level meters such as total contribution, total hits and total wins must not be readily adjustable in the Gaming System i.e. adjustments must only affect the prize level's current amount, be metered separately on special positive/negative prize level adjustment meters and recorded as an event in the Gaming System with full details (e.g. when, who, why, amount and final value).

16.3 The Gaming System must perform automated sanity checks on all adjustments, which are then also confirmed by the user before being applied to the current progressive prize amount.

16.4 Positive adjustments

16.4.1 Positive adjustments to the current prize amount in the Gaming System must be possible. Adjustments must not affect anything but the current prize amount (see 16.2) and possibly the overflow meter. The adjustments must be recorded on a 'total positive adjustments' meter in the Prize Totaliser.

16.4.2 A positive adjustment causing the prize to exceed its ceiling must be automatically handled by the Prize Totaliser by adding the excess to the overflow meter.

^{viii} Each prize level ever funded from the trust account would need to have been individually tallied with respect to its liability (current contribution and wins owing) within the overall trust account since account inception.

16.5 Negative adjustments.

- 16.5.1 Negative adjustments must only be applicable to the current prize amount (see 16.2) and the adjustments must be recorded on a 'total negative adjustments' meter in the Prize Totaliser.
- 16.5.2 A negative adjustment causing the prize to fall below the start-up amount must be prevented or automatically capped at the start-up or rejected by the Prize Totaliser.
- 16.5.3 Access rights to perform negative adjustments must be a mutually exclusive role in the Gaming System* and potentially capable of being assigned to a third party if required. *E.g. the same password should not give a user the right to perform both positive and negative adjustments.
- 16.5.4 DELETED
- 16.5.5 DELETED

17 Jackpot Display System Minimum Requirements

17.1 General

- 17.1.1 All jackpot artwork must be version controlled and must have a version number.
- 17.1.2 All revisions, changes or updates to approved jackpot display controllers, jackpot artwork or jackpot displays must be approved by OLGR before the equipment is supplied to Queensland casinos.
- 17.1.3 Only a licensed supplier may supply gaming equipment. A "licensed supplier" is defined in the *Gaming Machine Act 1991* as:
 - a) a licensed monitoring operator;
 - b) a licensed major dealer; or
 - c) a licensed secondary dealer.
- 17.1.4 Only licensed repairers are permitted to commission jackpot display controllers, or any jackpot displays that require connection to a jackpot display controller.

17.2 Jackpot Artwork

- 17.2.1 Jackpot artwork must be easily interpreted, unambiguous, and must not be misleading to the player. For example, jackpot artwork must not indicate a near miss when one didn't actually occur; advertise large prizes that are not reasonably probable (if the odds are stated or able to be ascertained from other artwork then no issue), or be overly complicated or confusing.
- 17.2.2 All statements on jackpot artwork must be true.
- 17.2.3 The name of the jackpot system must be displayed to the player.

- 17.2.4 Written instructions on jackpot artwork must be in English or any other official language with an adjacent English message.
- 17.2.5 Written instructions must be grammatically and syntactically correct.
- 17.2.6 Jackpot artwork must be clearly visible.
- 17.2.7 Jackpot artwork must not be in any manner or form indecent or offensive (e.g. pornographic or unduly offensive to religious groups).
- 17.2.8 Jackpot artwork must not contain depictions of currency.
- 17.2.9 The outcome of any result (e.g. a jackpot pool win) must be displayed for a reasonable length of time.
- 17.2.10 All electronic jackpot artwork must be able to be verified against a master copy held by OLGR using the SHA-1 hash algorithm.

17.3 Jackpot Display Systems

- 17.3.1 In order for a jackpot display system to be supplied to casinos, it must first undergo interface / acceptance testing by the casino operator. The jackpot display system may only be supplied to casinos if these tests are successfully completed. Documentation of these tests must be maintained by the casino operator, the jackpot display system supplier and where applicable, the jackpot display system manufacturer.
- 17.3.2 Jackpot display systems must be supplied to each venue with accompanying installation and operating manuals which contain the following information:
 - Information on any hardware connections and setup that may be required.
 - Information relating to any hardware or software configuration.
 - Any applicable safety information.
- 17.3.3 All jackpots that a player is eligible to win at any time must be clearly displayed to the player, unless the jackpot is specifically designed as a hidden jackpot.
- 17.3.4 A jackpot must not be offered at any time when it cannot be won. For example, if there is a hardware or communication failure of the Gaming System, it must be clear that the jackpot is off-line and unavailable.
- 17.3.5 Jackpot systems must adopt the policy "What You See Is What You Win" except with respect to other eligible (or simultaneous) winners of the same jackpot. This means the player is entitled to whatever is displayed by the jackpot display system except in a simultaneous win situation.
- 17.3.6 If BTs on a jackpot system remain in play during a jackpot win animation / jackpot notification, then the jackpot display system must be able to display two or more win animations / jackpot notifications in close succession without causing confusion.
- 17.3.7 Patrons playing BTs in a jackpot system must be able to see, from that location, the following information:
 - The current amounts of the jackpot system;
 - Any rules relating to the jackpot system;
 - If a win occurs on a BT, all win notifications relevant to that BT.

17.3.8 The current amounts of the jackpot system must be visible to all players of the jackpot system at all times. However, in arrangements where there is only one jackpot display, current amounts may be temporarily removed from view with respect to the following times:

- Idle animations can be displayed for a short period.
- Win animations can be displayed for a short period per win considering rapid jackpots. This is to avoid a situation where there is a backlog of win animations.
- After a win animation, it is acceptable to cycle short win messages with current amounts, until the win is paid.

17.3.9 If the jackpot prize for a player is less than the amount of money bet by the player to be eligible for the jackpot prize, then the jackpot display system must not refer to this situation as a win and must therefore not display win animations or play fanfares.

17.3.10 Jackpot display systems must not make misleading representations of the player's odds of winning the jackpot.

17.3.11 Jackpot display systems must not contain an "illusion of control" whereby the player is misled into thinking that they can have an impact on the outcome of the jackpot system when they actually can not.

For example, a player can choose 5 boxes from 10, and the player is led to believe the boxes contain different prizes. However, it does not matter which boxes are chosen as the player will always get the same prize (regardless of whether or not that prize is randomly chosen).

17.3.12 In the power save state the PT will do most of the normal functions including security monitoring and communication output (if the power save mode facility is supported). This requires that power to the logic board(s), security sensors and subsidiary equipment interface boards is maintained. The PT must suspend operation of all the connected EGMs in power save mode. The subsidiary equipment functional (SEF) input signal to each gaming machine is to be used for this purpose. The status condition is turned on when the power save condition is activated by an authorised person and is turned off when the condition is removed. A display message will also appear in the audit screen when the link controller has normal power applied.

In this condition power is available to the logic board(s), subsidiary equipment interfaces and all security sensing devices whilst the display and other "lighting" may have power removed. The method used to enter and exit the power save condition must be available to authorised persons only. Typically the power save mode would be activated by using a key switch or similar technique that avoids the use of a bi-directional communication channel into the main logic board. Note that the power save mode facility is an optional function for the link controller i.e. it does not have to be implemented. However, if it is implemented, the implemented power save mode facility must satisfy all the defined requirements in the standard.

17.4 Jackpot Displays

17.4.1 Jackpot displays must be positioned so that it is clear which BTs are a part of the jackpot system, and which BTs are not part of the jackpot system. Care must be taken to avoid situations where jackpot displays overhang BTs that are not part of the jackpot system.

- 17.4.2 Where BTs remain in play during any hardware or communication failures of the jackpot system which exempt one or more BTs from winning or contributing to the jackpot, the jackpot displays must indicate the jackpot is off-line and unavailable to those BTs.
- 17.4.3 Jackpot displays must be installed in a safe manner. Consideration must be given to the relevant work place health and safety requirements.
- 17.4.4 Jackpot displays must not be mounted directly on BTs and must not impede access to BTs. For example, in order to remove the top box of an EGM, it is not acceptable to first have to remove the jackpot display.
- 17.4.5 Jackpot displays must be supplied to venues with accompanying installation and operating manuals that provide comprehensive setup and maintenance instructions. If the jackpot display is a publicly available product (i.e. an “off the shelf” product) it must be supplied to the venue with the installation and operating manual for that display.
- 17.4.6 Jackpot displays must not source power from BTs unless specifically approved to do so.
- 17.4.7 Where a jackpot arrangement is split into two or more groups of EGMs and are physically located away from each other, signage must be used to advertise that the groups of EGMs are part of the same link e.g. using the same product / link name and clear signage which indicates that there are other participating EGMs.

17.5 Jackpot Display Controllers General

- 17.5.1 To allow OLGR to verify that digitised jackpot artwork contained in a jackpot display controller is the same as the approved jackpot artwork, jackpot display controllers must provide the ability to retrieve the jackpot artwork from the jackpot display controller in a portable electronic form (e.g. via compact flash, SD Media, CD, DVD or Hard Disk Drive Caddy).
- 17.5.2 Installation and operating manuals must be comprehensive, complete and foolproof.
- 17.5.3 Any hardware or software required to configure a jackpot display controller (e.g. keyboard, mouse, or setup utility) must be supplied with every jackpot display controller.
- 17.5.4 If a jackpot display controller requires any software configuration for correct operation (e.g. the manual entry of a communications timeout parameter), then the software configuration must be presented in a simple and easy to use Graphical User Interface. Command line configuration utilities and direct editing of text files are not acceptable. When designing this Graphical User Interface, assume users have only a rudimentary understanding of a computer’s operation (i.e. users know how to use a keyboard and mouse, with very limited understanding of anything else). All other configuration information must be detailed in the installation and operating manual. The intent is to simplify the installation process and reduce setup time of the jackpot display controller.
- 17.5.5 The software used by jackpot display controllers must include a version number.
- 17.5.6 Jackpot display controllers must be labelled with the manufacturer, model, the term “Jackpot Display Controller” and, if applicable, the theme the JDC is to be used for (this is to handle situations where the JDC can only be configured with a single theme).

- 17.5.7 All interfaces between the jackpot display controller and the monitoring system must be approved.
- 17.5.8 If the jackpot display controller loses communication with the monitoring system, all jackpot displays controlled by the jackpot display controller must display the message "Communications Timeout".
- 17.5.9 If a jackpot display controller loses communications with the jackpot system, then to avoid displaying aged or possibly incorrect current amounts, the display must timeout after an appropriate period. A period of 10 seconds is recommended for rapid jackpots. Other values for less frequent jackpots will be approved on request if deemed acceptable.
- 17.5.10 Jackpot display controllers must be located in a suitable position in a venue. The general public must not have access to the jackpot display controller. However, the jackpot display controller must be located in a convenient position to allow easy access for connections and configurations etc.
- 17.5.11 Jackpot display controllers must be capable of displaying the ceiling value of all levels. The maximum value that a jackpot display controller can display must be stated in the installation and operating manual or on the jackpot display controller itself.

18 Revision History

Version	Changes	Who	Release Date	Incept Date
1.0	Initial Release	MM	-	1/7/14
1.01	Change to new DJAG document template	JG		11/4/16
2.0 (Draft)	General updates to requirements to be casino specific. Added harm minimisation paragraph under Introduction Updated the scope to include FATG, ETG and traditional table game jackpots Added ETG and FATG definition Deleted 11.11 Added 5.16, 6.14, 8.11, 14.10, 14.12, 16.3, 17.4.7 Updated 5.9, 8.9, 10.9, 10.10, 10.16 The following jackpot limits have been updated: a. 5.9 Gaming Systems dealing with high prize amounts (typically greater than \$100,000) (<i>instead of \$60,000</i>) or a have generally high level of operating risk. b. 5.15: Communication Security: In Gaming Systems requiring a high degree of security, such as Gaming Systems with prizes or progressive prize ceilings more than \$250,000 (<i>instead of \$100,000</i>), or with a high level of operating risk, some form of authentication system may be mandated by the OLGR on critical communications in the Gaming System. This is at the discretion of the OLGR. c. High Risk PTDs - \$250,000 (<i>instead of \$100,000</i>) – refer section 10.10 and 10.11 d. 10.21: PTDs with prizes or ceilings in excess of \$100,000 (<i>instead of \$60,000</i>) may not be RAM cleared without prior approval from OLGR. e. 11.3.11: If a Gaming System is of the type at risk from Post Draw Close Attacks, has prizes or ceiling above \$250,000 (<i>instead of \$100,000</i>) and the PTD is a separate device from the BT(s), then the PTD must also include an acceptable Secure Hash Value (or the equivalent), of all 'bet details' pertaining to the draw that triggered the award. f. 12.3: For every prize won that is greater than \$100,000 (<i>instead of \$60,000</i>), authentication of the PTD by the party who sealed the device at the Gaming System operator's expense is required.	VS		
2.1	Deleted 10.4, 10.6, 15.1, 15.2, 16.5.4 and 16.5.5. Added 17.3.7 and 17.3.8	VS	18/6/2025	18/9/2025

* Where not stated otherwise the incept date for new or changed minimum requirements in this version of the document is 3 months from the release date of the document.