Office of Liquor and Gaming Regulation

Jackpot systems minimum technical requirements

Version 4.0

Queensland
Government

Contents

1   Introduction

This document describes the principles and technical requirements pertaining to Jackpot Systems (also referred to as Gaming Systems in this document) and Jackpot Display Systems.

Policy:

Gaming Systems must be submitted to the OLGR for evaluation and approval under various gaming Legislation.

Purpose:

The purpose of this document is to:

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

Scope:

As a set of policies and requirements for Gaming Systems, this document is noteworthy to developers and operators of many types of Gaming Systems.

This document does not apply to any gaming machine related jackpot systems intended to operate in Queensland casinos. Refer to Jackpot Systems Minimum Technical Requirements (Casinos).

Related OLGR Documents:

"Jackpot Systems Minimum Technical Requirements (Casinos)"
"OLGR Electronic Seal Minimum Requirements"
"OLGR Random Number Generator Minimum Requirements"

2   Definitions / Abbreviations

2.1   **General**

ANZ GMNS

Australia and 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 on 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 (e.g. EGMs 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) for whatever reason. Typically, once the prize level ceiling is reached, contributions will then go into an overflow meter.

Contributions

Refer section 8.

Current Amount
Current Value

The above terms both refer to the amount that would be awarded for a given prize / jackpot if won at this 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 hardware configuration 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

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internally offers a range of prizes/jackpots but may also be a part of a "Linked Jackpot Arrangement" as defined in the Acts.

Electronic Seal

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

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.

The predominant example concerning this document as a set of requirements 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, performing 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 System

Means 'Gaming System'.

Jackpot Triggering Device

Means 'Prize Triggering Device'.

Level

Refer to Prize Level below

Linked Jackpot Arrangement

This term is defined in the Queensland Gaming Machine Act.

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 a 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 of after an outcome has actually been determined in order to succeed.

Prize or Prize Level *(formerly jackpot 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 *(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 EPROMs, Flash ROMs, Hard Disks, CDROMs or DVDROMs.

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 Total Wins / Turnover x 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 14.24

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 exist 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

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 current amounts to players.

Win Animation

A win animation is 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

EGM based Gaming Systems are classified as either "Regulatory" or "Promotional". REGULATORY Gaming System fall under the jurisdiction of the *Gaming Machine Act 1991* and PROMOTIONAL Gaming System fall under the jurisdiction of the *Charitable and Non-Profit Gaming Act 1999*.

Prizes paid out in a REGULATORY Gaming System may be eligible to be considered as a gaming tax deduction[i].

Prizes paid out in a PROMOTIONAL Gaming System are not eligible as a liability against gaming tax. Refer to Appendix A for OLGR policies on the criteria to determine whether a Gaming System is eligible to be a REGULATORY prize.

3.1.2 DETERMINISTIC or NON-DETERMINTISTIC

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

In older OLGR publications, prizes with deterministic triggering algorithms have been referred to as "Deterministic Jackpots". This terminology is no longer used in this document as it is potentially ambiguous.[ii] **In this document all references of DETERMINISTIC or NON-DETERMINTISTIC refers to a property of a prize triggering algorithm.**

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 deterministic prize triggering algorithms, 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 associated 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.

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[i] In QLD Clubs and Hotels, the profit from machine gaming (i.e. Total Bets – Total Wins) is taxed.
[ii] *When using the term "deterministic" it is important for each use to specify a specific object to avoid confusion. For example, while a prize triggering algorithm may be DETERMINISTIC or NON-DETERMINTISTIC, progressive prize totalisation algorithms are inherently deterministic in nature.*

One example of a 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 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 component's 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.

<u>Gaming System Components – Major Inputs and Outputs</u>
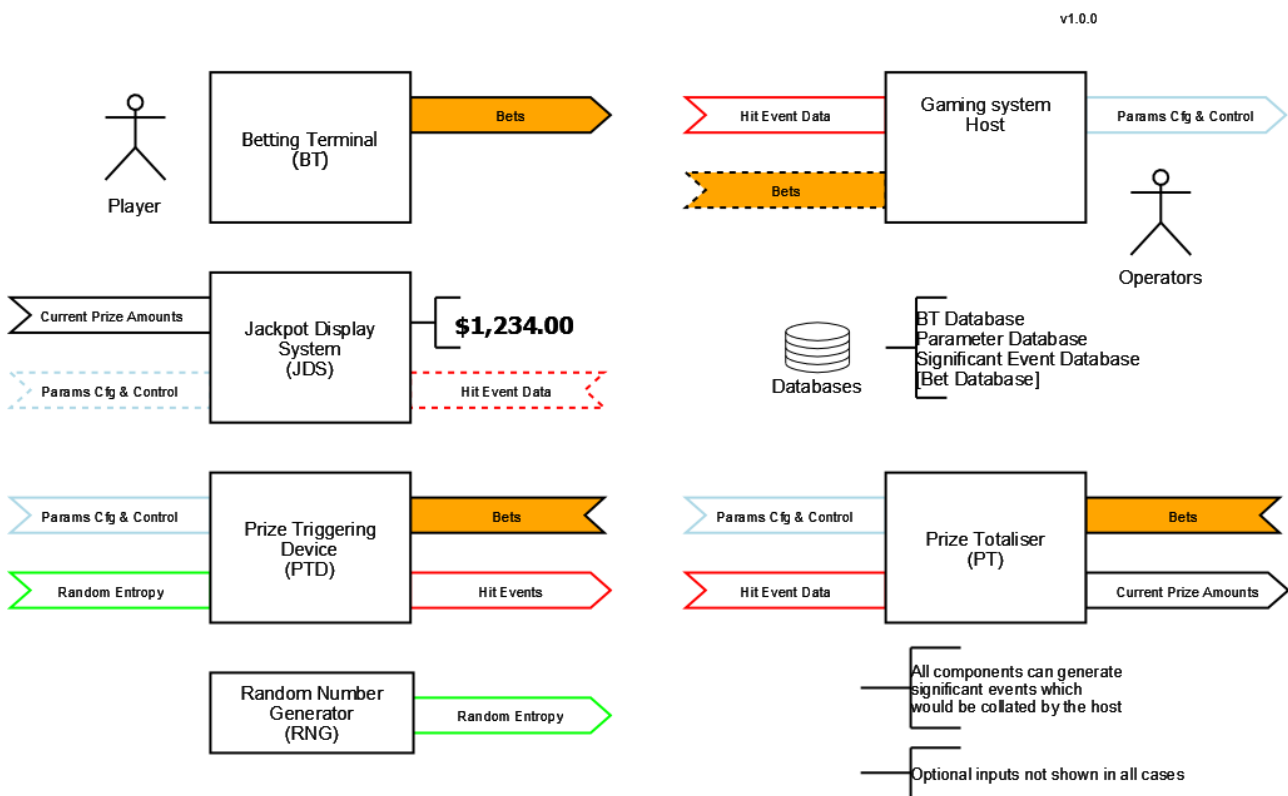
4 Gaming System Submission Requirements

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 include 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 where this risk is applicable.

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 5.10.

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 specially 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 OLGR approved Gaming Systems, as a condition of approval, will be limited to a nominated level of operating risk; this is typically in the form of a maximum prize limit. Thus the Gaming System may not be operated above the approved threshold without potentially a new risk / threat assessment and evaluation being performed and a new approval of the Gaming System.

This requirement is to prevent unchecked risk creep of prize parameters; without it, prizes may get higher and higher until such time than the cost of defeating a Gaming System is less than the reward from doing so, making the system an attractive target for attack.

5.2 Gaming System operators must have adequate controls and safeguards in place to ensure the integrity and audit-ability of the system and its operation.

5.3 A Gaming System must not contribute to undesirable playing behaviour such as compulsive gaming, frenzied play, or attract organised crime.

Related: section 14.11.

5.4 Fault Tolerant Storage.

All Gaming System critical meters, events and variables must be updated and stored fault tolerantly by the Gaming System. The minimum fault tolerance at any time is error detection and correction via a suitable arrangement of multiple physical and logical copies.

Jackpot system components located in potentially power volatile environments (any component not in a data centre meeting standards acceptable to the OLGR) must also auto recover from power disruptions occurring at any time with no loss of data (including full state recovery).

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

- Manufacturer/Supplier name

- Model name/number

- A label denoting its overall function where not obvious e.g. Prize Controller (a combined prize totaliser & PTD or generic term), Prize Totaliser, PTD, Jackpot Display, Jackpot Display Controller, Jackpot Display System, etc.

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

5.7   Policy concerning Gaming Systems based on EGMs

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

If an additional bet is required to participate in a Gaming System based on EGMs, then the Gaming System must conform to any related regulatory or local EGM requirements for the jurisdiction (e.g. minimum/maximum RTP, etc.).

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

5.9   In an EGM based Gaming System, if a Gaming System's RTP forms part of the regulatory minimum percentage Return to Player (e.g. 85% in Queensland Clubs & Hotels) 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.

5.10   Gaming System Risk / Threat Assessment

Gaming Systems dealing with prize amounts that could exceed **$60,000,** or a generally high level of operating risk, or when requested to do so by OLGR, must be submitted with a risk assessment addressing integrity, availability and security risks concerning the Gaming System. The risk assessment must address all possible vulnerabilities, attacks and corresponding preventative measures. The risk assessment must assume the attackers have full knowledge of how the system operates.

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

- Internal threats e.g. Operator personnel, 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.

In an approved gaming system, if the expected or actual operating risk subsequently increases since the system was originally evaluated, then a new risk assessment will be required to be performed and the Gaming System re-approved (if suitable) at the new level of risk. (Related: section 5.1)

The risk assessment should include an estimate of what would be required to defeat the security of the Gaming System. As a general rule, the cost estimate in order to defeat the Gaming System security should exceed the level of risk represented as a dollar value by at least a factor of three. As human costs (e.g. bribery) are hard to estimate, human based security / trust preferably should be minimised in the design of the Gaming System in favour of, for example, physical and virtual keys, locks and seals. If there are any human based risk factors in a Gaming System, then this risk must be able to be spread across an arbitrary number of individuals in proportion to the level of risk (e.g. multiple persons holding part of an overall key/password, appropriate access controls, etc.)

5.11   A note on taxation in regard to WA REGULATORY Gaming Systems containing EGMs in Queensland Clubs and hotels.

Under the Queensland Machine Gaming Act, the OLGR taxes on profit (i.e. metered win) for all in-house EGM and REGULATORY Gaming Systems. In its simplest form, this is calculated by:

Profit = total EGM turnover – total wins to credit meter – progressive wins.

However, the formula for profit for a gaming venue involved in a wide area (WA) REGULATORY Gaming System becomes:

Profit = total EGM turnover – total wins to the credit meter – total progressive wins + WA progressive wins – total WA contribution.

This alternative formula is to avoid the high risk of negative profits resulting from the first formula if used in a WAN Gaming System as they tend to have a very high standard deviation. Also, the second formula works better and is more fair with respect to multiple organisations participating in the link (e.g. if the first formula is used, the venue hosting the winning EGM gets all the tax break even though all venues contributed to the win value).

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

5.13   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 regarding the suitability of games / prizes with elements of strategic skill. Exceptions may be granted to components of gaming machine games under OLGR gaming guideline G08.

5.14   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 they are reduced RTP. This may be accomplished by displaying "Jackpot is unavailable" or similar message on the Jackpot Display System.

5.15   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.

5.16   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.

5.17   Communications - security

In Gaming Systems requiring a high degree of security, such as Gaming Systems with prizes or progressive prize ceilings in excess of $100,000, or with a high level of operating risk, some form of authentication system may be mandated by OLGR on critical communications in the Gaming System. This is at the discretion of OLGR.

5.18   Gaming System communications must be hardened in order to be immune to all possible malformed message attacks.

5.19   Volume Control

Gaming Systems that emit any sound must have the ability to control the volume of all sounds not pertaining to the awarding of a prize or alarms e.g. attract mode and betting mode sounds. Total muting must be possible on these types of sounds. The volume of prize/jackpot wins and alarm sounds must be controllable separately, refer section 11.12.

5.20   Allowable types of REGULATORY prizes.

All REGULATORY prizes must be in the form of cash (credits) e.g. a REGULATORY prize in the form of free games or other product is not currently permitted (OLGR policy).

5.21   Advertising prize hits in a time period is not acceptable.

For example, statements such as "Win up to $1000 every month" or "5 Stars hit every hour" are not acceptable as they do not quantify the probability of such an event and also make assumptions regarding play levels.

5.22   Where possible, it is preferred that BT's also contain a small Jackpot Display on the same display device as the bet display. This is for redundancy and fault tolerance i.e. so a player can see what they are betting on within the same display device.

5.23   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.

5.24   Decommissioning / commissioning prize levels must be secure and possible by authorised personal only. These actions must create auditable events in the Gaming System.

5.25   Under no circumstances are there to be any rounding errors or truncation errors in a Gaming System's financial handling. Of particular note here are any totalisation calculations and calculations upon a prize win or adjustment. Division operations (if any) should be closely scrutinised.

5.26   Funding Prizes (operational requirement)

Prize payers (operators) must maintain adequate funds (e.g. either in their general bank account or have an available line of credit from a reputable financial institution) to meet the contingent liability on the maximum prize on offer. (This fund is subject to audit by Gaming Inspectors.)

Prize payers must be aware that the funding of any fixed prizes drifts between surplus and deficit and therefore at times represent a liability to their organisation.

Through OLGR / industry publications, forums and audits by Gaming Inspectors OLGR draws attention to this issue and encourages venues to make sound commercial decisions and make suitable commercial arrangements to meet the contingent liability when it arises.

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.). The default accounting period must be 24 hours.

6.3 Reporting

Gaming venues with 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 progressive 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 also be totalled.)

6.3.3 Reconcile per prize level, total auto-paid prizes and total hand paid prize with total prize wins.

6.4 For REGULATORY Gaming Systems in Queensland Clubs and Hotels, all regulatory forms[iii] which are affected by the Gaming System must be automatically generated by the Gaming System for the gaming venue via an approved *accounting package[iv]*.

6.5 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.

6.6 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.

[iii] For EGM based Jackpot Systems in the Queensland Clubs and Hotels market this refers to regulatory Forms 41 & 61.
[iv] Refer Gaming Machine Regulation 2002.

6.7   Audit Interface.

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

6.8   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).

6.9   In systems which trigger prizes based on BT contributions, it must be possible to reconcile contributions from each BT against total contributions in the corresponding PTD via the audit interfaces on the devices.

6.10   In Gaming Systems where the Prize Totaliser and PTD are not the same physical device and both are utilising the same contributions, 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.

6.11   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:

6.11.1   The current date and time. (Applies to all Gaming System components individually.)

6.11.2   The total number of BTs enrolled on a level (per PTD).

6.11.3   The total number of BTs enrolled on prizes under the PTD per venue (if applicable).

6.11.4   (PTD only) The current calculated PTD program hash value for an arbitrarily entered seed. The hash algorithm must be secure.

6.11.5   Everything else below should also be assessable from the Gaming System host.

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

6.11.6   Level name, number and ID

6.11.7   Level creation/last change date and time

6.11.8   Total turnover and total contributions (2 meters)

6.11.9   Total turnover and total contribution since last prize hit (2 meters)

6.11.10   Total hits

6.11.11   Total wins (mandatory in Prize Totalisers only)

6.11.12   Total ECT and ECT threshold (if applicable on the Prize Totaliser)

6.11.13   Total simultaneous wins & overpay meter (if applicable on the Prize Totaliser)

6.11.14   Prize current amount (Prize Totaliser only)

6.11.15   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.)

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

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

6.11.18   Minimum Number of BTs (from approval, refer 14.8)

6.11.19   Maximum number of BTs (from approval, refer 14.7)

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 contributing BT per level per Prize Totaliser:

6.11.20   BT serial number

6.11.21   BT floor ID / location ID

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

6.12   In a REGULATORY Gaming System, the information listed in 6.11 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.

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

6.14   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.

6.15   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 cleanly 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 algorithms [v].

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

7.1   Prizes with DETERMINISTIC triggering algorithms will only be permitted as a trade promotion (i.e. subject to the provisions of the Charitable and Non-Profit Gaming Act 1999) with the venue operator and/or monitoring operator (depending on the contractual arrangements between the venue and the operator) being responsible for the funding of the prize.

7.2   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.

7.3   No audible attract mode enticement is permitted to incite player interest in and participation on prizes with deterministic triggering algorithms. Win fanfares are acceptable.

7.4   Prizes with DETERMINISTIC triggering algorithms cannot have an upper prize limit or prize ceilings in excess of $5,000. Below this limit, the setting of prize level amounts is a matter for the venue and/or operator.

7.5   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.

7.6   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.

7.7   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.

7.8   An EGM is not allowed to trigger (i.e. it is the PTD) a prize or feature with deterministic triggering algorithms except as a promotion under the Charitable and Non Profit Act.

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

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).

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. the limit is not 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

Two possible example implementations for the handling of prize overflow are:

- When a prize reaches its ceiling, additional prize contributions are excluded from

contributing to the prize's current amount.

This method and similar methods (involving prize contribution exclusion) will not be approved unless the effect on the prize's RTP cannot also be precisely calculated.

- 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.

  This second method is much more common and arguably more popular with players.

In all scenarios:

- The approved prize RTP must reflect the overflow management methodology utilised.

- 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 Further to the above, any other proposed REGULATORY Gaming Systems whose RTP is not mathematically calculable without significant speculation or assumptions, will unlikely be deemed acceptable.

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 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 System's 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 considered to be the most critical component of any Gaming System.

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

- 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. a 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 Upon commissioning, an OLGR inspector must record and tamper seal all PTDs with prizes or ceilings in excess of $60,000 at the Gaming System operator's expense. This inspection entails verifying the correct number and size of the program storage devices and a local comparison of the program storage devices with approved copies held by OLGR. Generally, this will have to be done at OLGR premises.

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 A seal registry must be maintained for all seals in use with REGULATORY Gaming Systems with prizes or ceilings in excess of $5,000.

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. Exception: 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 $100,000 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 $100,000) 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 SHA-1 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 whereby 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. Critical events such as sealed area accessed events, linked prize win events (refer 11.3) and prize level parameter change events for example, must not be able to be purged by any means other than a full reset of the PTD, however the PTD may overwrite old events with new events as they are generated. Given a PTD's level of operating risk it must be suitably difficult for an attacker external to the PTD to be able to spam new events into a PTD in order to force flush out any critical events. 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. Event logs must be of sufficient size depending on its operating environment (such as PTD to host connection frequency) and level of operating risk.

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 $60,000 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 contribution that triggered the prize initially. (In many systems this will just reflect the amount of the bet from the winning BT.) *This is just for possible verification in the event of an issue.*

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 can be 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 $100,000 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 within the PTD signed draw result / event.

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 player's 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   If a player loyalty system is being used in conjunction with a Gaming System, then upon the occurrence of any difficulty or dispute in the winning player, the prize must be paid by default to the registered owner of the player loyalty card which was in use on the winning BT at the time the prize won was triggered. A statement to this effect must be written into the player Terms and Conditions of the Gaming System.

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 (refer section 5.19). 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 prize related 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 based 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 $60,000, 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 and obey section 14.21, 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 OLGR.

14.6   Prize hit rates must be reasonable (refer 14.20) and suitable for the given number of BTs (see below).

14.7   All prize parameters must be approved with a maximum number of BTs as a condition of approval.

This is to avoid problems that can occur from the over subscription of BTs to a linked prize creating a 'jackpot buyout' type situation (where the contribution could exceed the hit rate of the prize, or saturation of the prize triggering algorithm). Especially susceptible are rapid linked prize levels where the time between wins is small.

The side effects of this that can occur are:

- Lowers of the RTP of the fixed / start-up component of a prize (this problem is specific to centrally triggered type prizes of any degree).

- Wins occurring faster than the jackpot display system can perform the win shows.

Win shows (animations) take time. This could lead to walkaways or general confusion if delayed too long.

- An unacceptable number of simultaneous wins (which in the extreme can start to inflate the RTP of a Gaming System when all eligible winners are being paid in full)

14.8   All prize parameters must be approved with a minimum number of BTs as a condition of approval.

All prize parameters intended for linked operation (or any chance thereof) must be approved with a minimum number of BTs in order to operate.

Under some Queensland legislation, by definition, linked prizes or linked jackpot arrangements are required to have two BTs as a minimum[vi].

For more information refer section 14.20.

14.9   Changing the number of BTs on a Gaming System

Adding and removing BTs may be done at the Gaming System operator's discretion so long as any minimum or maximum conditions on the number of BT's or other operating conditions for the Gaming System are not exceeded.

14.10   The theoretical total RTP of a Gaming System must be less than 100% at all times under all conditions and within any specific local jurisdictional RTP range limits (e.g. EGMs in Queensland Clubs & Hotel market must be in the range 85…92%).

Note prizes using DETERMINISTIC triggering algorithms typically cannot meet this requirement and therefore this requirement does not apply to prizes using DETERMINISTIC triggering algorithms that adhere to the conditions in appendix A and other requirements pertaining to prizes using DETERMINISTIC triggering algorithms in this document.

14.11   Where a buyout of a prize in a Gaming System is possible (e.g. a Gaming System where every combination can potentially be bought by a single or syndicated group of people), or in a machine gaming environment for example where every BT could potentially be monopolised by an organised group of people (syndicated play); then with one or more of its progressive prizes set at its ceiling value, the resulting calculated RTP must always be less than 100%.

This requirement stems from that fact that if a Gaming System offers a guaranteed profit, even for very short periods on an irregular basis, it may contribute to undesirable playing behaviour such as compulsive gaming, frenzied play, or attract organised crime. Refer 5.3

Note prizes using DETERMINISTIC triggering algorithms typically cannot meet this requirement and therefore this requirement does not apply to prizes using

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[vi] The QLD Machine Gaming Act 1991 requires a minimum of two machines in order to be considered a Linked Jackpot Arrangement.

DETERMINISTIC triggering algorithms that adhere to the conditions in appendix A and other requirements pertaining to prizes using DETERMINISTIC triggering algorithms in this document.

14.12 Prize Oversubscription

This is applicable to prizes using a triggering algorithm which is weighted on the size of the contributions and a common risk of centrally triggered Gaming Systems.

Prize oversubscription refers to any single contribution presented to the prize triggering algorithm, which is so large that the prize triggering algorithm will overflow, resulting in a probability (p) of winning for the contribution reaching or exceeding 1.0 e.g. adding too many BTs to a rapid prize will cause this.

Prize oversubscription is an issue, because when it occurs, the theoretical RTP is not maintained (it will drop) as the chance of winning typically gets truncated to 1.0 by a properly programmed PTD, or if the exception is not handled, it could cause an error (or other undesirable effects) in the PTD's prize triggering algorithm.

Prize Oversubscription is more likely to occur with rapid triggering linked prizes with an excessive number of BTs that utilise a triggering algorithm that aggregates bet and scales up trigger probability accordingly.

Gaming Systems must automatically detect link progressive prize oversubscription.

If a contribution causing an oversubscription occurs, the PTD must cap the probability at 1.0 and log a critical event with full details.

One example of how to handle a prize oversubscription in an alternative fashion 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 and careful attention to any given prize's BT limit.

Related: 14.7.

14.13 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.

14.14 Clarity and timing of prize parameter changes

Ideally parameter changes only occur upon the end of a trading day / accounting period. Changes must never be instigated during any player's current gaming "session".

During a parameter change, BTs must have zero credit and be disabled. This is to help ensure changes are not made while a player is in attendance on any BT.

14.15 For REGULATORY prizes with ceilings exceeding $60,000, parameter changes must not be physically possible in the PTD without OLGR authorisation. This must also require the use of physical seals or encryption to prevent unauthorised changes taking place at other times.

This requirement also applies to the creation and deletion of prize levels.

14.16 When a change in prize parameters is performed, all prize current contribution (including any wins owing) must be carried over.

When a change in prize parameters is performed, to maintain a persistent theoretical percentage return, the current contribution (for a vanilla LP this is defined as the current Prize value minus the start-up amount (SUP), plus any overflow) and any wins owing (if applicable) must be carried over for each level to the new prize.

Example 1:

Old Parameters:
SUP   = $100
INCREMENT = dc%
Current Value = $125

New Parameters:
SUP   = $50
INCREMENT = dc%
Current Value = $75 (carry over $25 regardless of change in INC or RESET)

Example 2:

Old Parameters:
SUP   = $100
INCREMENT = dc%
CEILING   = $200
OVERFLOW = $30
Current Value = $200

New Parameters:
SUP   = $50
INCREMENT = dc%
CEILING   = $250
OVERFLOW = $0
Current Value = $180 (carried $130 over)

Example 3: A WA linked jackpot (note the new wins owing term)

Old Parameters:
SUP   = $1000
INCREMENT = dc%
SUPINC   = dc% (increment to fund SUP component i.e. SUP RTP)

(wins owing = $333 i.e. increments to fund SUP are in surplus)
Current Value = $1250

New Parameters:
SUP   = $2000
INCREMENT = dc%
SUPINC   = dc%
Current Value = $2583

(dc = don't care)

Example 4: A WA linked jackpot (note the new wins owing term)

Old Parameters:
SUP   = $1000
INCREMENT = dc%
SUPINC   = dc% (increment to fund SUP component i.e. SUP RTP)
          (wins owing = $-123 i.e. increments to fund SUP are in deficit)
Current Value = $1250

New Parameters:
SUP   = $2000
INCREMENT = dc%
SUPINC   = dc%
Current Value = $2250

(dc = don't care)

Depending on the value of the new parameters, as demonstrated above, this can have the adverse effect of causing the prize current amount to go backwards from the player's point of view. The operator may decide to deal with any adverse reactions. However, it is also acceptable for the operator to make up the difference at their own expense at their discretion.

14.17 Prize parameter changes resulting in an increase of the prize current amount

Any prize parameter adjustment may create a situation where the new prize current amount works out to be greater then the ceiling. This case must be handled if applicable. The ceiling must always be correctly applied (14.21) and any amount over the prize ceiling must automatically be carried onto the overflow of the new prize.

14.18 Prize parameter changes resulting in an decrease of the prize current amount

Another special case to handle (depending on how the prize is implemented), is when a prize becomes a fixed prize (0% increment) as a result of a parameter adjustment. There will be some contribution to be carried over. Ideally, Gaming Systems able to handle a fixed prize level that can accept positive adjustments as a contribution to the current value, even though the % increment of the prize is zero, make the task of carrying over contribution easy.

Example:

SUP   = $500
INC   = 0%

Current Value = $500

After a positive adjustment of $111:

SUP   = $500
INC   = 0%
Current Value = $611

After the next win the new current amount will revert back to $500.

14.19   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).

14.20   Frequency of Prizes

If a prize's odds are not clearly publicly displayed, or reasonably able to be calculable by the participating playing community based on publicly available information (e.g. rules display)[vii]; a prize that is too improbable (see next paragraph) may be considered misleading and therefore the prize parameters must meet the following requirement:

Given the minimum number of BTs competing for a given prize, an agreed expected average daily BT turnover and the expected operating life, a prize level must not be operated or approved which does not have at least a **95%** confidence that each prize will be won during its expected life. In some cases, approvals may contain conditions concerning a minimum operation lifetime commitment, and/or a minimum average daily turnover and/or a minimum number of BTs in order to operate (section 14.8). A different set of issues may occur if a LP prize's hit rate is too frequent. Refer to section 14.7.
The assumptions required to make a determination in regard to the above requirement can make an evaluation rather subjective. Accordingly, it may also be a requirement (or

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[vii] E.g. the game of keno is considered readily calculable game, whereas gaming machine prizes are generally not, as the reels strips layouts, etc., are typically hidden from players.

approval condition) that recalculations with respect to the above requirement are made periodically throughout the operational life of the prize using accumulated operational data. (The easy solution for high value, infrequent prizes is to simply make the prize's odds publicly displayed or publicly calculable from displayed artwork or rules.)

In the case the prize's odds are clearly publicly displayed, or readily calculable by the participating playing community, then there is no restriction here on a prize's probability provided no other requirements apply, such as requirements pertaining to very high prizes, or to low and frequent LP prizes for example.

Related: The ANZ GMNS requirement relating to prize probability quoted below, must be adhered to by gaming machine triggered prizes:

> *"The probability for attaining any advertised prizes and events must not be less than 1/7,000,000 (at a rate of at least 1 in 7 million plays)."*

> The assumptions in relation to the above requirement are detailed in ANZ GMNS which notably exempts link progressive prizes.

14.21 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.

Accordingly, jackpot ceilings must be setup within the following limits:

Minimum Ceiling Limit (Ceiling$_{lower}$)

All prize levels must have ceilings that are set no lower than a 95% confidence that the prize will be awarded before the ceiling is reached. This is commonly referred to as a 95% confidence interval.

Maximum Ceiling Limit (Ceiling$_{upper}$)

For prize levels with a Minimum Ceiling Limit above $1000, the ceiling must be set no higher than a 99% confidence that the prize will be awarded before the ceiling is reached. This is commonly referred to as a 99% confidence interval.

Exceptions:

Ceiling levels must be set just over the 99% CI if it results in a figure which is a more rounded figure than otherwise e.g. for a CI range of $956 - $998 a ceiling of $1,000 would be deemed acceptable in this case.

For prize levels with a Minimum Ceiling Limit less than or equal to $1000, a maximum ceiling limit greater than a 99% confidence interval may also be approved, up to a maximum CI of 99.99%, provided that:

- The ceilings of the prize levels in this category are not advertised as an enticement to play.

- The expected RTP with all the prizes at their ceilings will not result in the total theoretical expected total RTP to exceed 100% at any time (break-even threshold).

Formulas:

The ceiling formulas for a vanilla progressive level above $1000 are:

$$Ceiling_{upper} = StartUp + \left[\frac{\%INC}{100} \times \frac{\log 0.01}{\log(1-p)} \right]$$

$$Ceiling_{lower} = StartUp + \left[\frac{\%INC}{100} \times \frac{\log 0.05}{\log(1-p)} \right]$$

Where:

p = hit/win probability per cent bet[viii];
%INC = Percentage increment of the prize current amount (in percent);
Ceiling & Startup are in units of cents.
The constants 0.01 % 0.05 translate from the respective 99% and 95% confidence intervals.

For example, for a progressive prize level with StartUp = $50, %increment = 2% and an ATV (Theoretical Average Trigger Value) = $100

p_{win} = 4×10^{-6} per cent bet (see section 14.24)
$Ceiling_{upper}$ = $280.25
$Ceiling_{lower}$ = $199.78

For non-vanilla progressive prizes, the formulas for the upper and lower ceiling confidence intervals may be very difficult to determine. In these cases, it is much easier to use numerical methods.

Rounding of ceiling amounts

The intent here is to avoid ceilings that cause confusion when they are reached because

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[viii] The use of units of "cents" is arbitrary. It is possible to work in units of dollars, cents or credits, so long as all other variables have the same base units.

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 must as possible i.e. as many trailing '0's in the number as possible but still within the upper and lower limits determined by the CI formulas.

In the above example, ceilings of $200 ($10^2$) or $280 ($10^1$) would be ok and may also be a candidate for $300 because the amounts are low in this case.

Another example:

Ceiling$_{upper}$ = $125,383.45
Ceiling$_{lower}$ = $84,893.91

Acceptable ceilings could be: $90,000.00, $100,000.00 ($10^5$), $120,000.00 ($10^4$), or $125,000.00

As the ceiling lower limit is not negotiable, the formula for Ceiling$_{lower}$ must be hard-coded into any Prize Totaliser and automatically applied as a failsafe before the Prize Totaliser will accept any new ceiling amount for a prize level.

14.22 RTP Constraints

The following two requirements are both OLGR policy as well as prize level parameter sanity checks. As sanity checks, they are designed to prevent accidentally entered invalid prize parameters from being accepted by a PTD. They also prevent 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).

14.22.1   For the Queensland Clubs & Hotels EGM market, where a non-EGM triggered gaming system is run in conjunction with EGMs, the sum of its RTP added to the EGM's total RTP must not exceed the OLGR prescribed maximum RTP for EGMs on any EGM. For example, where the OLGR prescribed EGM RTP limits are: min. 85%, max. 92%; the maximum possible RTP of a non-EGM triggered Gaming System is 7% when utilising EGMs set at 85.0% RTP. The overall maximum RTP of 92% must not be exceeded.

14.22.2   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%. If the PTD is an EGM, then a second RTP limit must also be applied which should equal the MAXRTP of the gaming jurisdiction.

14.23 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.

14.24 Formulas

Typical formulas for a 'vanilla' progressive prize level:

Reconciliation formula for a vanilla progressive prize level:

Prize Current Amount + Overflow = Applicable Turnover x %INC/100 + (Hits+1) x Start Up – Wins + Initial Contribution (if any) + Positive Adjustments – Negative Adjustments + SimWinOP

Total prize %RTP = %Inc + 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:

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

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 ix

14.25   Lower limit on start-up amounts

All remotely re-configurable PTDs which are also Prize Totalisers must be hard-coded to automatically reject any prize level configurations which have a start-up amount of less than $10.

This limit makes it more difficult to tamper with a prize by changing the parameters and adjusting the prize current amount. Being able to set a SUP amount to zero (or close to) allows the prize probability to be changed without affecting the % RTP or prize current amount which could be used to circumvent other sanity checks in the system.

14.26   The ceiling of one prize level in a jackpot arrangement is not to exceed the start up value of a higher (less probable) level in the same arrangement. That is, prize level ranges within a Gaming System must not overlap and must be in strictly increasing value from the lowest prize level to the highest prize level.

14.27   Linked Jackpot Arrangements with the same advertised name, operating within the same gaming venue, must be configured to have the same RTP on each participating BT.

14.28   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 confirm the new theoretical RTP and parameters by the user before accepting the change. *Systems should not try to calculate RTP for prizes that it doesn't also trigger. In this case the RTP for a given set of parameters should be sourced from the relevant / applicable source or authority for confirmation purposes.*

- Changes to progressive prize ceilings. The Gaming System must ask for confirmation of the new ceiling amount before accepting. *Systems should not try to calculate the progressive prize ceilings or ceiling Confidence Intervals (section 14.21) for prizes it doesn't also trigger. In this case the ceilings or ceiling CIs for a given set of parameters should be sourced from the relevant / applicable source or authority for*

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ix 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.

confirmation purposes.

- 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 Prize Levels

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 Amount[x], less the prize Start-up amounts plus any Overflow[xi]. 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 contributions are not inadvertently counted as a gaming tax deduction more than once. (This risk can eventuate when a prize is decommissioned and wins owing are transferred from one jackpot to another[xii].)
- 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 except in cases when the two prizes have the same player base / participating gaming venue/s.
- 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   A REGULATORY linked Gaming System may not be decommissioned, until approval is granted by OLGR. Refer to the *Gaming Machine Act 1991*.

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[x] 'Current Amount': The amount that is paid out if the prize is won at that very instant
[xi] i.e. CA – SUP + OVERFLOW
[xii] E.g. transferring funds from any WA LP to a local area LP, or a SAP will result in a gaming tax deduction more than once

Also refer to the Gaming Machine Act concerning all requirements pertaining to Approved Trust Accounts relating to multiple site linked jackpots.

15.2   The main policy applied by OLGR is that **current contributions** and **wins owing** (if any) must eventually be paid to players as winnings where possible.

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).

    In exceptional circumstances, contributions may be applied towards furthering the objects of the venue in the case of a club, or in the case of a hotel enhancing facilities at the venue, or be donated to charity. In such circumstances, the venue is to advise OLGR and obtain written approval for the purpose

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 Never transfer amounts from a WA trust account to a LA jackpot pool (i.e. a gaming venue funded prize) as it will mean that the amount will get counted as a gaming tax deduction more than once.

15.6   Decommissioning Examples

Example 1 - Decommissioning a single REGULATORY PROGRESSIVE SAP BT

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

$$i.e.\ Sum_{perLevel}\ of\ (CurrentAmount_n - SUP_n + Overflow_n)$$

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

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

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 or arrangement

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.**[xiii] (This is why trust accounts initially need seeding[xiv] and the occasional topping up to avoid running dry.)

There are two formulas[xv] for calculating the fixed prize component liability for a single linked progressive level:

Formula 1: (is based on per level prize meters)

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

Where:

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

Upon decommissioning, if the Liability$_{fpc}$ 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[xvi], or as otherwise as directed by the CEO, OLGR.

[xiii] Mathematically this varying liability is referred to as a 'random walk'

[xiv] 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').

[xv] Formulas shown pertain to vanilla progressive prizes

[xvi] Wins owing from a decommissioned trust account funded prize cannot be transferred to a non-trust account funded prize because this may create a situation where the amount becomes a gaming tax deduction more than once.

Upon decommissioning, if the Liability$_{fpc}$ 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 for a prize level, 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 an arrangement, the wins owing will be in deficit and therefore they will incur a loss on that arrangement. *This is not calculable probability being essentially a 'random walk'.*

Formula 2: (is based on having a trust fund per arrangement and CA – SUP prize level meters pre prize)

Calculations can be simpler when the operator maintains **an approved trust fund per jackpot** arrangement.

$$Liability_{fpc} = TrustAcc - (CA - SUP)_{per\ prize} - ContribSUP - ExContrib$$

Where:

TrustAcc	= Current amount in the trust fund.
CA	= Value of the fixed prize (or current jackpot amount).
SUP	= Value of the fixed prize (or start-up amount).
ContribSUP	= Contributions to fund start-up e.g. initial seeding.
ExContrib	= Extra contributions made to trust fund that is not a result of EGM turnover e.g. occasional top-ups.

NB:

- The jackpot's progressive component wins owing must always be calculated before anything such as any seeding or top-up amounts are removed from the fund.

Formula 1 is the preferred method and is to be used if the information is readily available. However if there is a delay in obtaining the information that adversely impacts gaming integrity, formula 2 can be used. Note, OLGR will use both formulas for reconciliation and auditing purposes.

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

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. This is because the contributions in a Wide Area prize level have already been*

included as a gaming tax deduction, if they are added to either of the above, then the amounts will end up being included as a gaming tax deduction for a second time.

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 Machine Gaming Act and associated Regulation for more information.

This is a potentially a more complex scenario and requires accounting over the life of the trust account **on a per arrangement basis** in order to solve[xvii]. 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.

[xvii] 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   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 personnel 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   All adjustments must be sanity checked and confirmed by the user before being applied to the current progressive prize amount. Refer 14.28.

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.

16.4.3   Positive adjustments must be sanity checked to ensure that after the adjustment, the RTP of the Gaming System is re-calculated using the positive adjustment and that it does not end up exceeding the regulatory maximum RTP and strictly never be allowed to push the RTP over 100%.

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   Every negative adjustments of a prize current amount must be first approved by either an OLGR inspector under the relevant Act or the CEO OLGR.

16.5.5   A written request must be received by the Office with full disclosure of the events leading to the need for the negative adjustment. The negative adjustment may be subsequently approved by OLGR if, given the available information on the incident, OLGR concurs the adjustment is warranted.

17 Jackpot Display Systems 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 gaming venues.

17.1.3   Only a licensed supplier may supply gaming equipment. A "licensed supplier" is defined in the Gaming Machine Act 1991 as:

- a licensed monitoring operator;
- a licensed major dealer; or
- 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.

17.1.5   Jackpot artwork can only be installed within the gaming area, and must be directly associated with and physically located near participating BTs.

For example, a sign displaying the current amounts of a jackpot system:

- can be located within the gaming area, on the wall behind or on a stand above the EGMs that are participating in the jackpot system;

- cannot be located at the entrance of a venue (if that entrance is not part of the gaming area);

- cannot be located at a bar or other service counter (if the bar or service counter are not part of the gaming area);

- must not be placed in such a way that causes patrons to infer machines are participating in a jackpot but are not actually (e.g. using a two sided jackpot display sign located on a two sided bank of EGMs but where only one bank of the EGMs is actually enrolled / participating in the jackpot e.g. generally placed signs that may be inferred to mean that the entire venue is on a jackpot when in reality only a sub-set of EGMs are).

17.1.6   Any advertising of jackpot systems or jackpot system components should be in accordance with the "Queensland Responsible Gambling Code of Practice".

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 there is no issue), or be overly complicated or confusing.

17.2.2   All statements on jackpot artwork must be true.

17.2.3   All jackpot arrangements/themes must have a name which must be clearly 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   Jackpot artwork must not contain depictions of, or references to any casino game (such as Roulette, Blackjack, etc.).

17.2.10 The outcome of any result (e.g. a jackpot win) must be displayed for a reasonable length of time.

17.2.11 All electronic jackpot artwork must be able to be verified against a master copy held by OLGR using the SHA-256 hash algorithm.

17.2.12 All submitted artwork that is not in English must be accompanied with a translation certificate by the National Accreditation Authority for Translators and Interpreters (NAATI) or equivalent.

17.3 Jackpot Display Systems

17.3.1   In order for a jackpot display system to be supplied to venues, it must first undergo interface / acceptance testing by the LMO. The jackpot display system may only be supplied to venues if these tests are successfully completed. Documentation of these tests must be maintained by the LMO, the jackpot display system supplier and where applicable, the jackpot display system manufacturer.

17.3.2   Jackpot display systems may only be installed if both the LMO and venue agree to the installation.

17.3.3   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.

17.3.4   All jackpots amounts 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.

17.3.5   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 jackpot system, it must be clear that the jackpot is off-line and unavailable.

17.3.6   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.

17.3.7   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.

17.3.8   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.

17.3.9   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 but for no more than 45 seconds in every 5 minute period.
- Win animations can be displayed for no more than 30 seconds per win. This should be scaled in down 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.

17.3.10   Tension Building

For example, after a jackpot has been triggered, the jackpot display system may display an animation which leads up to revealing the winning player or BT i.e. it "builds tension" before informing the players of who exactly has won the jackpot. The players recognise the animations lead to a win outcome.

In a Linked Jackpot Arrangement, the time period from when a jackpot win event has been revealed to players to when the players are actually informed of who has won the jackpot must not exceed 50 seconds.

The associated concern here is that during the tension building period, some players mistakenly believe that increasing their rate of bet during the period may increase their change of winning, when in reality the outcome has already been determined. In some cases OLGR has demanded signage stating "play during <a reference to the tension building period / animation> does not increase your chance of winning" or similar. A message or the equivalent will be required in most cases of tension building.

17.3.11   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.

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

17.3.13   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 don't.

For example, a player is required to press a button to release a ball that is swaying from a height, and the player is led to believe the ball will fall into a jackpot prize container based on when the button was pressed. However, it does not matter when the button is pressed, as the ball will fall into a predetermined jackpot prize container.

17.3.14   If a jackpot system includes a Wide Area (WA) prize / jackpot the following applies:

- The name of the jackpot system operator must be clearly displayed to the public via the jackpot display system.

- The jackpot display system must ensure that WA levels are uniquely identified, so that players are informed of which WA levels they are participating in. This may be accomplished by appropriate "branding" of WA levels.

For example, it must not be possible for a player to believe that a WA level at Venue A, is the same as a WA level at Venue B, if those WA levels are different.

17.3.15   Every prize level in a gaming system must have a unique name or identifier (e.g. a symbol or even a trigger pattern diagram) clearly and consistently displayed to the players of a jackpot system. There must be no confusion about level identification.

For example, a three level jackpot could have the top level named as "Grand", the middle level names as "Major" and the lowest level named "Mini".

17.3.16   Jackpot display systems must have an automatic facility to switch jackpot display devices into a power save mode, where the jackpot display devices are turned off to conserve power and prolong display life. This facility must automatically turn off all jackpot display devices at an adjustable set time (e.g. venue closing time) and then turn them back on at a subsequent adjustable set time (e.g. venue opening time).

The power save should activate after 15 minutes timeout by default.

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 (e.g. in venue "satellite" configurations, or multi-venue links), 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 is paramount and clear signage which either indicates that there are other participating EGMs must be used e.g. "State-Wide Link", or "More <product name> machines are located throughout the venue", or "there are x machines on this link located…".

The intent is to avoid players thinking that 'what they see' is all that is competing for the jackpot they are participating.

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, 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.

Where possible the jackpot display controller configuration GUI must auto-detect and present a list of available jackpots to choose from. This must be in addition to allowing full manual entry.

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 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.

17.5.11   Jackpot display controllers must handle positive and negative adjustments correctly.

For example, if a current amount is negatively adjusted or positively adjusted by a large amount, the jackpot display controller must display the new value correctly. This is especially important for jackpot display controllers that "roll up" current amounts on screen.

17.5.12   On power up, a jackpot display system must not display progressive prize amounts until the current amounts have been updated by the prize totaliser. This is to avoid displaying out of date values for the current amounts.

17.5.13   Jackpot display controllers must be located in a suitable position in a venue. The location would generally be at the discretion of the installer unless otherwise conditioned within a technical approval or subject to any statutory or other requirements not administered through the technical approval. Consideration should be given to cooling as needed. The general public must not have access to the jackpot display controller, however, it must be located conveniently to allow easy access for connections and configurations, etc.

17.5.14   Unless approved by OLGR, jackpot display controllers (other than EGMs that control their own displays) must not be installed inside EGMs. Note that approval will need to be granted for every type of EGM into which the jackpot display controller will be installed.

18 JDS Related Submission Requirements

All Jackpot Display System related submissions must comply with the latest version of the "OLGR Submission Requirements" document in addition to the following requirements:

18.1 General

18.1.1 All documentation and artwork material must be submitted in electronic format.

18.2 Jackpot Display System Submissions

18.2.1 All jackpot display system submissions must contain a block diagram of the system.

18.2.2 All jackpot display system submissions must contain a functional description of the system.

18.2.3 All jackpot display system submissions must include installation and operating manuals where appropriate. See also 17.3.3

18.2.4 All applicable elements of sections 18.3, 18.4 and 18.5 must also be submitted.

18.3 Jackpot Display Controller Submissions

18.3.1 Jackpot display controller submissions must include installation and operating manuals.

18.3.2 The jackpot display controller must be submitted to OLGR.

18.3.3 Any tools that will be required to gain access to the jackpot artwork contained on the jackpot display controller must be supplied. This is to allow signature verification to be performed on jackpot artwork.

18.3.4 A functional description of the operation of the jackpot display controller, including details of the methodology used to display current amounts and to detect communications errors must be supplied.

18.3.5 If the jackpot display controller is LMO controlled, then a demonstration must be organised with OLGR and the LMO at the LMO's test site.

18.3.6 All jackpot display controller submissions must contain digital photographs of the jackpot display controller and any other components required to run the jackpot display controller.

18.3.7 All elements of section 18.4 must also be submitted.

18.4 Jackpot Artwork Submissions

18.4.1 All jackpot artwork must be submitted electronically in exactly the same file format, resolution and colour palette as it will be used in the jackpot display controller. This is so direct file comparisons may be performed against approved artwork. If the file format is a non-standard or non-proprietary file format, then an appropriate viewer must also be submitted.

18.4.2   If there is more than one item of jackpot artwork on the display controller, then a table indicating which files are displayed and when must be submitted.

For example: WIN_MAJOR.AVI played when the major level has been awarded.

18.5   Jackpot Display Submissions

18.5.1   If the jackpot display is a form of active display (such as a monitor, Translux style LED array, display projector or similar), the submission must also contain the following:

a)   All jackpot display submissions must contain digital photographs of the jackpot display and any other components required to run the jackpot display. Note that the display device is not required to be submitted.

b)   A specifications document that lists key information such as dimensions, weight, brightness and contrast.

c)   If the display device is not a publicly available product (i.e. an "off the shelf" product), then the submission must contain evidence that the display device meets the current Australian standards relating to electromagnetic interference, electromagnetic immunity, radio frequency interference and radio frequency immunity.

18.5.2   If the jackpot display is in the form of a sign or other static (non-animated) device, then an image of the sign which clearly shows any jackpot artwork contained on the sign, and the overall dimensions of the sign must be submitted.

Appendix A – Gaming Taxation

OLGR POLICY

TAX DEDUCTIBILITY OF JACKPOTS IN CLUBS AND HOTELS PURSUANT TO THE GAMING MACHINE ACT 1991

To be considered as a tax deductible jackpot, all of the following elements must be satisfied:

- The jackpot must be triggered by a random event and the random event must not be "deterministic"

- An amount must be contributed to the jackpot from each play on the gaming machine

- The probability of winning the jackpot must be proportional to the amount bet

- The jackpot Return To Player, plus the Return To Player of the gaming machine must not exceed the 92% maximum Return To Player

- The jackpot must be part of the electronic monitoring system

- The jackpot prize must be in the form of money

The above policy does not amend the application of the Charitable and Non-Profit Gaming Act 1999 to promotional games conducted under that Act (that is, expenses for such promotional games remain non-deductible for taxation purposes).

David Ford
<u>Executive Director</u>
13 September 2000

Appendix B – QCOM v1.x packet sniffing display controllers

A QCOM Protocol v1.x packet sniffing jackpot display controller is a device that obtains information by listening to the data transmitted on a QCOM v.1x network. In Queensland Clubs & Hotels, this is usually achieved via an additional fibre optic interface (FOI) card connected to the QCOM v1.x fibre optic loop at a venue (preferred method), or by listening to data received from within the BT or EGM. Refer to the OLGR "QCOM v1 EGM Communications Interface and LAN Requirements" document for more information on tapping into QCOM communications.

Note in this section PGID means Progressive Group ID. Refer to the QCOM protocol v1.x document for more information.

1. QCOM packet sniffing jackpot display controllers must not have a transmit line physically connected.

2. QCOM packet sniffing jackpot display controllers need to be configured with a PGID. In addition to allowing manual entry of a PGID, during setup, the device must monitor QCOM "Linked Progressive Current Amounts Broadcast" (LPB) messages in order to present the user with a list of detected PGIDs to select from. The intent is to avoid errors with PGID value entry due to human error. PGID entry/display must be 4 digit zero padded hexadecimal e.g. "0ABC". Related section 17.5.4.

3. QCOM v1.x packet sniffing jackpot display controllers that must be placed in a specific location on the LAN (such as EGM jackpot event sniffing displays) must have a suitable message (e.g. "Locate unit on loop after jackpot EGMs") displayed in a clearly visible location on the jackpot display controller.

4. QCOM v1.x packet sniffing jackpot display controllers that monitor the QCOM v1.x "Linked Progressive Current Amounts Broadcast" (LPB) messages must handle the situation where more than one jackpot system may be operating in the same venue (i.e. the LPB contains information relating to several PGIDs.)

5. QCOM v1.x LPB message sniffing jackpot display controllers must clearly display the message "Communications Timeout" when the jackpot display controller does not receive any QCOM v1.x broadcast messages after a time-out period.

6. After a time-out period, on a per level basis, QCOM v1.x LPB message sniffing jackpot display controllers must clearly display the message "Timeout" when the jackpot display controller does not receive LPBs containing a respective progressive level's amount for which it is configured to display. The time-out message must replace/overwrite the applicable level's current amount value display.

   Note: It is recommended that the timeout period for the above 2 requirements is a variable parameter in the jackpot display system, and that this parameter defaults to 60 seconds (but no lower) to cater for more than one PGID on the loop.

7. Jackpot display controllers that display win animations triggered by monitoring negative movements in LPB message level amounts are less preferable to jackpot display controllers that sniff for "Linked Progressive Acknowledgement Poll" in order to trigger win animations. This is because negative adjustments of current amounts (for example, due to an RTP change) will inadvertently also trigger win animations on these types of jackpot displays.

8. QCOM v1.x packet sniffing jackpot display controllers must utilise the QCOM Site Enable Flag (SEF) so that when the site is disabled via the SEF, the power save will activate. Related: section 17.3.16.

Revision History

Version	What	Who	Date
4.0 edocs: #2063853	• Minor clarifications to s14.20 based on feedback. • s17.2.11 updated wording to sha-256 • Added new requirement regarding artwork translation submissions. Refer s17.2.12. • Fixed a couple of typos. • Clarified s15 policy and fixed associated examples: "*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 **except in cases when the two prizes have the same player base / participating gaming venue/s***" (The text in bold was added)	RL	20-Apr-2022
4.0 Draft #1617800	• Clarified document scope to more broadly apply to all jackpot systems but still excludes casinos. • General clarifications and other housekeeping tasks. • Clarified all references to QCOM are to QCOM version 1.x. Changes to requirements: • Refer 5.13 re skill. Added reference to G08 • Refer s14.20 – minor clarifications to wording. • Refer s14.21 ceiling must be set just over the 99% CI when this can result in a neater ceiling figure. • Refer s14.22.1. Clarified existing requirement. • Refer s14.26, clarified that this requirement was intended to apply to both LP and SAP. • Refer s15.6 Decommissioning Examples. Clarified how WAJ wins owing can be made much simpler by using trust funds to help calculate wins owing. • Refer 16.4.3 re positive adjustments: minor clarifications to wording. • Refer 17.3.12-13: Fixed examples • Refer 17.5.13 clarification of wording • Refer 17.5.15 – deleted as now a part of 17.5.13 • Refer 17.5.16 - deleted	MM / RL / DS	6-Oct-2021
3.0.1	Changed to new DJAG template	JG	11/4/16
3.0	Changes from 3.0 draft to 3.0 final based on industry feedback: • Minor clarifications to 5.7, 6.15, 8.4 & 11.3.7 • Reviewed / clarified section 10.15 • Clarified the section on prize overflow (8.8) • Deleted requirement for "silent mode" (formerly section 5.26) • Added new section 8.11 regarding Pre-Draw Close Attacks and Draw Substitution Attacks • Updated front page to latest template • Electronic seals must be used for high risk PTDs (10.10) • Clarified 5.4 in response to feedback	RL	20-Feb-2015
3.0 draft (for industry comment)	• Full review of the former Jackpot System Minimum requirements document. • As a set of requirements this document is only applicable to QLD clubs & hotels market • Terminology changes: "was" => "is now"	RLL	11 Mar 2014

Version	What	Who	Date
	"Jackpot Systems" => "Gaming Systems" "Jackpot Controller" => "Prize Totaliser" "Jackpot System" => "Gaming System" "Jackpot Triggering Device" => "Prize Triggering Device" "Jackpot Level" => "Prize level" "Contributing Devices" (CDs) => "Betting Terminals" (BTs) • Removed all RNG requirements as this is now covered by a separate OLGR standard. • Added requirement for volume control of idle mode sounds. • Clarified usage of term 'Digital Signature' as opposed to 'hash values'. • The use of Digital Signatures on PTD jackpot hit events is now mandatory (11.4). • Added requirement to handle situation whereby the PTD & RNG are separate physical devices. (10.14) • Added more requirements for sanity checks on PTDs. • Changes to the section on decommissioning of jackpots, especially in regards to wide area jackpot decommissioning (aka wins owing) • More reasonable requirements concerning negative adjustments • Added requirement for 'silent mode' of operation • **Merged with "Jackpot System display Requirements" document version 1.2.1 & 1.3 draft**		
2.1	• Corrected 14.23 to make the requirement applicable only to a Jackpot System that advertises ceilings. • Added 14.26, regarding overlapping prize levels. • Added "Lottery" type Jackpot System and "Post-Betting" definition and requirements. • Signatures to include "bets" in a Jackpot System with large ceilings. • Jackpot System with large ceilings to possibly have authentication mandated. • Added requirement to prevent overlapping jackpot ranges • Added requirement for error detection and recovery in communications between sub-sections of a Jackpot System. • Refer red-line and strike-out text.	MB	28-01-2005
2.0	• General clarifications and updates. • Added a submissions section. • Added a more comprehensive submissions section. • Added minimum time that info must be displayed. • Made more generic, less references to EGM specific Jackpot Systems. • Added reference to "Jackpot Display Requirements" documents. • Added several new PTD requirements	RL / MB	22-9-2004
1.3	• Appendix A has become a stand alone standard called 'OLGR Electronic Seal Minimum Requirements' • Refer red-line and strike-out text for other changes.	RL	06-09-2001
1.2	• Refer red-line and strike-out text for changes.	RL	25-10-2000
1.1	• Refer red-line and strike-out text for new requirements.	RL	25-10-2000
1.0	• Combined requirements from CMS minimum requirements document and Jackpot Policy document. • Refer red-line text for new requirements.	RL	09-09-2000