

Keno System Technical Standard

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Table of Contents

- I. Introduction 4
 - I.1. Gaming in Tasmania 4
 - I.2. Key bodies 4
 - I.3. Objective 5
 - I.4. Scope and Purpose 5
 - I.5. Dispensations 6
 - I.6. Associated Documentation 6
 - I.7. Copyright 7
- 2. System 7
 - 2.1. General System Requirements 7
- 3. Hardware/Software 8
 - 3.1. Approval 8
 - 3.2. Central Site Requirements 8
 - 3.3. Requirement for Encryption 10
 - 3.4. Keno System Requirements 10
 - 3.5. Significant Events 12
 - 3.6. Reporting Requirements 13
 - 3.7. Audit Trail 14
 - 3.8. Keno Terminal Requirements 15
 - 3.9. Keno Random Number Generator Requirements 16
 - 3.10. Keno Results Processing 19
 - 3.11. Requirement for Time of Day Adjustments 20
- 4. Keno Game Rules and Instructions 20
- 5. System Documentation 21
- 6. System Backup and Recovery 21
 - 6.1. System Backup 21
 - 6.2. Data Recovery 21



- 7. Source Code..... 22
- 7.1. Requirements..... 22
- 8. Glossary 23
- 9. Version Control..... 25



I. Introduction

I.1. Gaming in Tasmania

Tasmania is a State of Australia. It is the southern-most and only island-State. Tasmania has its own Government and its own Parliament that makes laws on matters that are not controlled by the Australian Government under section 51 of the *Australian Constitution*. For more information about Tasmania, its landscape, climate, history and people, go to the Tasmanian Government's website at www.tas.gov.au.

The *Gaming Control Act 1993* sets out the regulatory framework that permits the different forms of legalised gaming and wagering in Tasmania and is the principal authority.

The Act applies to internet and terrestrial based gaming. Terrestrial-based forms of gaming include table games, electronic gaming machines and Keno, as well as minor gaming activities that are not-for-profit (such as raffles, bingo and lucky envelopes).

Gaming in Tasmania is highly regulated and strictly controlled and covers gaming in Tasmanian casinos (commencing with the first Australian legal casino in 1973), Tasmanian hotels and clubs, gaming on board Bass Strait ferry services, minor gaming such as raffles, bingo etc. Additionally, since 1999, the Commission has regulated gaming activities conducted from Tasmania using the Internet and other remote connections.

The Commission undertakes probity investigations of licence applicants and requires ongoing disclosure, systems to be independently tested and some operational staff to be licensed. It also enforces strong consumer and player protection requirements.

I.2. Key bodies

I.2.1. *Tasmanian Liquor and Gaming Commission*

The Tasmanian Liquor and Gaming Commission was established by the *Gaming Control Act 1993* as the independent body responsible for overseeing the regulation of gaming and wagering in Tasmania. The Commission is comprised of three people and meets monthly, as required. Its functions are prescribed in section 125 of the Act.

For further information about the Commission, including its Operating Statement and Annual Reports go to: www.gaming.tas.gov.au.

I.2.2. *Liquor and Gaming Branch*

The Commission is supported by staff of the Liquor and Gaming Branch of the Department of Treasury and Finance. Branch responsibilities include preparing and coordinating information for the Commission's monthly meetings and specific staff have been delegated some of the powers of the Commission to facilitate efficient and effective regulation. The Branch also has licensing, compliance and policy support functions.

The contact details for the Commission and staff of the Liquor and Gaming Branch are:

Phone: +61 3 6166 4040

Email: gaming@treasury.tas.gov.au

Mail: GPO Box 1374

Web: www.gaming.tas.gov.au

Hobart Tas 7001

I.3. Objective

I.3.1. The objective of this standard is to ensure that keno systems operated in Tasmania are designed to:

- be compliant with minimum technical requirements for terrestrial keno systems;
- ensure the integrity of transactions and fairness of the keno game outcomes;
- ensure the security and auditability of the keno system, including connected gaming equipment operating in venues;
- ensure the keno system accurately monitors, records and reports information and transactions relating to the operation of the game;
- ensure the keno system complies with Tasmanian legislation and Commission Rules;
- ensure the keno system correctly calculates gross profit;
- ensure the keno system correctly awards all player entitlements; and
- minimise the potential for harm from gambling and provide support for consumer protection measures.

I.3.2. To ensure the integrity of gaming, to the greatest extent reasonably possible, a keno system must only be operated by a keno operator. Related venue based gaming equipment used in Tasmania must only be operated from within licensed gaming premises. This requirement does not prevent keno operators from obtaining a system from an external supplier authorised under the Act or entering into third party arrangements to host gaming equipment on the behalf of a keno operator.

I.3.3. The supply of a keno system requires the approval of the hardware and software, and the approval of internal controls, which include the keno operator's documented system of procedures for operating the system. This Standard does not stipulate keno game rules or internal controls, but in prescribing keno system requirements, assumes that system has the capacity to comply with effective internal controls and keno rules.

I.4. Scope and Purpose

I.4.1. The scope and purpose of this document is to prescribe minimum requirements for the functionality of a keno system that may be approved by the Commission following evaluation, taking into account requirements of Tasmanian gaming legislation and other adopted standards.

- I.4.2. The process for the approval of the proposed product will be determined by the Commission, in consultation with the supplier. It is required that Accredited Testing Facilities (ATFs) undertake independent testing of the keno system to ensure compliance with this Standard and other regulatory requirements.
- I.4.3. It is expected that ATFs and suppliers of gaming equipment will need to undergo probity and be listed on the Commission's Roll of Manufacturers, Suppliers and Testers of Gaming Equipment. Unless otherwise authorised by the Commission, a Roll listing is required prior to undertaking related activities in Tasmania. The current Roll listing can be viewed at www.gaming.tas.gov.au.
- I.4.4. It shall also be noted that compliance with this Standard does not exempt the supplier and keno operator from compliance with other laws (e.g. laws relating to privacy, consumer protection, prohibited content, copyright, electrical safety and electronic cash transactions).
- I.4.5. This document does not seek to mandate use of any specific keno system, however, it is expected that any supplied system must comply with this Standard.

I.5. Dispensations

- I.5.1. In special circumstances, gaming equipment which does not fully comply with all the requirements specified in this Standard may be considered for approval, provided the gaming equipment operates in a manner that is suitable in respect of:
- fairness;
 - security;
 - integrity; and
 - consumer protection.

Approval of any such equipment will be at the sole discretion of the Commission.

I.6. Associated Documentation

- I.6.1. Potential suppliers, third party suppliers and system developers should also familiarise themselves with the following to ensure the keno system suitability:
- *Gaming Control Act 1993*;
 - Rules of Keno;
 - TLGC Responsible Gambling Mandatory Code of Practice;
 - TLGC Casino Licence Rules;
 - TLGC Licensed Premises Gaming Licence Rules
 - TLGC Gaming Operator Licence Rules;
 - *Anti-Money Laundering and Counter-Terrorism Financing Act 2006*;
 - *Privacy Act 1988*;

- Technical Standards for Recorded Surveillance in all Gaming and Wagering Premises – TGCVS004; and
- ISO/IEC 27002:2013 Information Technology – Security Techniques – Code of practice for information security controls.

1.7. Copyright

The Tasmanian Liquor and Gaming Commission wishes to provide its acknowledgement and thanks to the Queensland Office of Liquor and Gaming Regulation (QOLGR) and Victorian Commission for Gambling and Liquor Regulation (VCLGR) for granting it permission to use its Technical Requirements as a basis for the development of this Standard.

This document is the property of the State of Tasmania (Department of Treasury and Finance). Copying, making extracts or use of the document, without prior permissions, is prohibited. Additionally, all material that has been sourced from the QOLGR or VCLGR technical standards continues to remain the property of those jurisdictions. Accordingly, Queensland and Victorian sourced requirements in this document remain subject to copyright laws applicable to each jurisdiction.

2. System

2.1. General System Requirements

2.1.1. The keno system must perform the following functions:

- generate keno draws securely and randomly in an unpredictable manner;
- monitor and maintain the security of connected gaming equipment;
- monitor and maintain the compliant operation of keno in Tasmanian venues;
- maintain accurate keno operating records, including, but not limited to keno number draw close and commencement, drawn game results, bet type, ticket serial number(s), sales, cancels, pays, jackpot transactions, venue operating hours and other significant events, in a secure and auditable fashion;
- provide an electronic facility to enable live monitoring of keno game events, including, close sell, draw commencement, draw results, large bet and win events, central site voucher generation, scanning of frozen ticket(s), failed user and terminal login events;
- provide accurate reporting for all keno transactions;
- ensure compliance with approved Keno Rules;
- provide precise gross profit calculations; and
- provide support for consumer protection measures as determined by the Commission.

3. Hardware/Software

3.1. Approval

- 3.1.1. All gaming equipment used by the keno system to conduct gaming must be considered suitable for approval pursuant to section 81 of the *Gaming Control Act 1993*.
- 3.1.2. The keno system, including all its components, must only be used and operated in accordance with the Commission's approval notice for the gaming equipment.
- 3.1.3. The keno system must only be operated in accordance with separately approved keno rules pursuant to section 79 of the *Gaming Control Act 1993*.
- 3.1.4. The keno system, including all of its components, must comply with Australian electrical safety standards.
- 3.1.5. The keno system must be able to monitor and report on the game's comparative performance with respect to its theoretical Return to Player (RTP).
- 3.1.6. The keno system may have multiple or third party suppliers, however, approval must be obtained from the Commission for each gaming equipment component and the supplier must be listed on the Roll; unless otherwise authorised by the Commission.

3.2. Central Site Requirements

- 3.2.1. To ensure reliable performance, the central site host responsible for hosting the keno system must meet all minimum hardware and software specifications.
- 3.2.2. Security is paramount to the integrity of the keno system to protect against fraud, to secure information and to ensure game operations only occur as designed and approved.
- 3.2.3. The keno system's central site host must be located in a secure data centre. The facility must be physically secure to prevent unauthorised access and actively monitor access. Records of physical access to the centre must be retained for at least three months and be secure against deletion or editing. It is required that 24 hour CCTV coverage is included in this monitoring.
- 3.2.4. Unless otherwise authorised by the Commission, secure data centres hosting gaming equipment and keno records must only be accessible by central site licensed staff, licensed technicians, Commission Inspectors or contractors that are accompanied by a licensed staff member. Non-licensed persons must not operate, maintain or repair gaming equipment in a data centre or be left unaccompanied unless specifically approved by the Commission under third party contractual arrangements between a keno operator and a third party storage provider, pursuant to section 77V(2) of the *Gaming Control Act 1993*.
- 3.2.5. If the data centre houses multiple organisations, or is responsible for performing draws, additional assessments to address any security risks will need to be determined by the Commission.
- 3.2.6. The central system physical security must be constructed in accordance with Australian Standard AS 2834 for computer accommodation. In this respect, the Commission will

accept certification in the areas of expertise by qualified builders, electricians etc. This requirement therefore does not require certification by an ATF.

- 3.2.7. Operation of the data centre must be in accordance with Standards Australia requirements AS ISO/IEC 27001 and 27002 or equivalent standards.
- 3.2.8. The Commission requires documentation of the Network Security Policy. This document is to be reviewed and evaluated by an ATF.
- 3.2.9. Where a central keno system's processing is split so that part of the process are processed outside the secure data centre to another secure data centre, communications between them must be encrypted and secure against interception.
- 3.2.10. A keno data storage device must not be decommissioned unless all keno information is permanently erased from it. If the information cannot be fully erased, the device must be physically destroyed.
- 3.2.11. If physical or logical security is detected as having been breached and there is a risk that keno information, game integrity or the system may have been compromised, the Commission must be informed as soon as possible and kept updated as the investigation progresses.
- 3.2.12. The use of a non-licensed third-party data storage provider may be acceptable for the purpose of hosting a keno operator's approved gaming equipment and records, provided the contractual arrangements entered into, as authorised by the Commission, ensure that:
 - access to all gaming equipment and records stored on third party infrastructure is restricted to the keno operator;
 - gaming equipment and records are managed and maintained in accordance with this Standard (including minimum data centre security requirements) and legislative requirements;
 - gaming equipment and records are only operated from third party infrastructure locations within Australia;
 - the keno operator maintains full control and ownership of all gaming equipment and gaming records stored on third party infrastructure; and
 - in the event the contract is terminated, suitable controls must be in place with the third party storage provider to enable normal access and recovery of the keno operator's gaming equipment and gaming records content.
- 3.2.13. Keno operators must ensure keno central site hosts are configured to protect against:
 - unauthorised attempts to access a user account;
 - unauthorised attempts to access system resources;
 - unauthorised attempts to view or change system security definitions or system security rules;
 - unauthorised attempts to add, modify or delete critical system data and approved application software;

- irregular patterns of use for system or user accounts;
 - irregular or unexpected changes to security configuration; and
 - significant authorised changes to security configuration.
- 3.2.14. All programs and important data files must only be accessed by the entry of a password that is known only to authorised personnel, and that each authorised person must have a unique password that is encrypted in a non-reversible form.
- 3.2.15. To ensure keno software remains in an approved state, keno central site hosts must fully support implementation of change control systems, as required by the Commission. This may involve implementation of joint password controls to restrict access to sensitive keno software, deterministic game functions and/or regulated gaming records.

3.3. Requirement for Encryption

- 3.3.1. Where sensitive data is being passed over communication lines, such data must be encrypted. Examples of sensitive data that require encryption are passwords and encryption keys, including any information that if made public could compromise the integrity and security of the keno system.
- 3.3.2. Sensitive data must be encrypted on an end-to-end basis (for example the data must never appear on a LAN or WAN in an un-encrypted form). This includes sensitive data transmitted between keno equipment within a licensed premises.
- 3.3.3. Sensitive data transmitted between systems within a single secure data centre need not be encrypted unless the information is used to determine game outcomes.
- 3.3.4. Sensitive data transmitted between keno system infrastructure located within separate secure data centres need not be encrypted if the communications path is physically secure and cannot be accessed by unauthorised people.
- 3.3.5. Encryption systems are to be demonstrably secure. Only published, public, encryption algorithms and protocols shall be used and must have a demonstrated track record against attacks and a history of reliable performance.

3.4. Keno System Requirements

- 3.4.1. The keno operator must ensure that access to specific functions within keno system applications is restricted to specified users and requires the prior entry of the highest level password(s). The functions to be restricted include, but are not limited to:
- prize table changes;
 - random number generator changes and game/system redundancy functions;
 - jackpot parameter changes;
 - other system parameter changes;
 - installation of new versions of software;



- the use of data editors, utilities or related software, such as SQL, for database access to regulated records or update (manual or otherwise) whilst ensuring these are not accessible by unauthorised persons; and
 - access to serial numbers or other identifying information required to process unclaimed prizes stored on the system (eg. unclaimed payouts / winning tickets).
- 3.4.2. All keno draws must be conducted securely and be unpredictable.
- 3.4.3. The keno system must be able to securely interface with gaming equipment located in Tasmanian keno venues.
- 3.4.4. The keno system must not allow the enrolment of new terminals unless first registered and validated by the central site host.
- 3.4.5. The keno system must not permit the live operation of games in venues unless the authentication of approved gaming equipment (including terminals) has been successfully completed.
- 3.4.6. The keno system must have high levels of security with different access levels and all changes to software must be securely logged and reportable.
- 3.4.7. The keno system must be able to identify and maintain an audit trail of terminal operator use in keno venues.
- 3.4.8. The keno system must prevent the sale of tickets if purchased games cannot be recorded or processed correctly by the host system.
- 3.4.9. The keno system must not permit the sale of tickets for a game where the draw for that game has already commenced.
- 3.4.10. The keno system is to prevent late cancelation of a purchased game after the draw for the game has commenced.
- 3.4.11. After a keno game has been completed, the keno system must ensure the correct payment of prizes to customers from connected keno terminals.
- 3.4.12. The keno system must be configured to prevent live operation of unapproved game features and functions.
- 3.4.13. All ticket serial numbers generated by the keno system must be uniquely identifiable and created by a secure and tamper proof process.
- 3.4.14. The keno system must provide a secure method to enable the recovery of lost or unclaimed tickets. Unclaimed tickets must not be able to be recovered without the prior approval of the Liquor and Gaming Branch.
- 3.4.15. Keno systems using physical balls to conduct game draws will not be considered suitable for approval unless separately certified to be within specification and kept in a secure location. The keno operator will need to discuss security arrangements and the period of retention of CCTV footage in accordance with Surveillance Standards. Additionally, draw result history will need to be retained and audited annually by an ATF to ensure ongoing integrity.

3.5. Significant Events

- 3.5.1. The keno system must be able to provide a means to record and view all significant events, including the ability to search and report on particular event types.
- 3.5.2. The keno system must be able to record events correctly and allow for appropriate action to be undertaken where required (for example, disable a connected venue terminal or keno draw, if required).
- 3.5.3. A complete log of transactions/events since the last backup is to be maintained on the central site host.
- 3.5.4. For transaction logging, the keno operator must ensure that:
 - the central keno system records (with time/date stamp) all vital transactions received from any equipment that processes a gambling transaction;
 - the log file(s) and/or database(s) must be duplicated for integrity and reliability; and
 - all adjustments or modifications to the transactions (and unclaimed prizes) must be recorded with the keno system operator's user ID (and time/date-stamp).
- 3.5.5. All transactions and events are to be sequentially written to a secure log in the order that they occur.
- 3.5.6. A date and time stamp (when the event occurred) must mark each record for all keno transactions and it must be possible to retrieve events in a serial fashion.
- 3.5.7. There must be no possible means of "adding events or records" to the middle of the log or "writing over" existing records.
- 3.5.8. There must be no possible means of adding to, amending, "writing over" or deleting any transaction, event or data contained in the log of existing records.
- 3.5.9. Adjustments to accounting on the keno system must be subject to strict security control and audit trail.
- 3.5.10. Significant events may also be stored in subsidiary points of the keno system, however, access to reporting must be provided centrally.
- 3.5.11. In the event of the failure of the central system database, it must be possible to electronically recover the significant events using a method that ensures information is not lost.
- 3.5.12. The keno operator must establish and maintain policies and procedures for reporting significant events to the Liquor and Gaming Branch, including but not limited to:
 - instances where there has been unauthorised access to the system;
 - instances where approved internal control procedures and Keno Rules were unable to be followed;
 - situations where system hardware or software version roll-backs were carried out;

- instances where a system verification tests have failed, including random number randomness tests and approved software state verification failures;
- instances where a system commences using a different or backup keno host hardware or software, including changes to the random number generator devices;
- instances where late event / draw closures have occurred;
- identified game draw malfunctions;
- instances where incorrect payout calculations have occurred;
- instances where central site voucher creation and processing has occurred; and
- instances of changes to prize tables, jackpot parameters or prorating parameters.

3.6. Reporting Requirements

3.6.1. There are three main areas in which a system must be able to fulfil its tasks in providing verifiable reports to the Commission. These are:

- financial activity and transaction reporting of all keno games;
- keno significant event reporting; and
- the provision of regulatory reports as required.

3.6.2. The keno system must allow for flexible reporting modules to support extensible reporting options, where required by the Commission.

3.6.3. Any alterations or adjustments to reports must be authorised by the Commission and the keno operator must provide a written explanation for these changes.

3.6.4. All reporting must be accurate and there must be the ability to verify the integrity of reports to ensure reports remain certified and approved.

3.6.5. The keno system must have the capacity to provide the Liquor and Gaming Branch with remote reporting access in a secure manner from required locations. This reporting access includes access to web based reporting systems that are able to facilitate the generation of reports for periods up to the close of the last trading day.

3.6.6. The keno system must be capable of automatically generating a daily regulatory financial summary report and include the following minimum information for keno venue totals:

- sales;
- cancels;
- pays;
- refunds;
- adjustments;
- commission; and
- SST voucher sales and redemptions;

- 3.6.7. The system must provide reporting information in relation to calculated levy totals that may be payable (eg a levy percentage).
- 3.6.8. The system must allow for reports to be generated for a selectable date range to allow for daily, weekly, monthly and annual reporting periods.
- 3.6.9. The keno system must provide significant event reporting for all keno transactions that have occurred in keno venues. This includes venue specific reporting of keno ticket point of sale transactions, scanning of tickets (including events where paid/claimed tickets have been re-scanned), payment, cancellation and central site voucher transactions. Note: Reporting of significant events that cannot be stored on the keno system due to data retention reasons must remain available on secondary systems for reporting purposes.
- 3.6.10. The keno system must provide reporting for venue issued cheques.
- 3.6.11. The keno system must provide reporting in relation to jackpot transaction sale totals.
- 3.6.12. The keno system must provide venue commission earnings reporting.
- 3.6.13. The keno system must provide venue gross profit reporting in relation to venue sales minus cancels minus wins in a format that differentiates gross profit derived from standard and jackpot keno ticket sales.
- 3.6.14. The keno system must provide RTP performance reporting by comparing actual total game returns to the theoretical return.
- 3.6.15. The keno system must provide reporting in relation to the locations where keno terminals have been installed.
- 3.6.16. The keno system must provide current reporting of all prize pools.
- 3.6.17. The keno system must provide transaction reporting to that contains sufficient information to allow for the identification of suspicious betting events (ie. patterns of large betting and win events). Note: Where feasible, the system may also support real time event alerts for transaction types that have credit betting characteristics (ie. large heads/tails betting or other types of bets) as determined by the keno operator.
- 3.6.18. The keno system must provide accurate reporting to ensure compliance with keno venue opening and closing hours.
- 3.6.19. The keno system must provide reporting on events where software verification failures have occurred. Note: This reporting functionality may be provided for by third party systems if not directly supported by the keno system.
- 3.6.20. The keno system must provide reporting to permit tracking of tickets flows within a licensed keno venues, including events relating to ticket purchases, scans and payments.

3.7. Audit Trail

- 3.7.1. The keno system must be able to reconcile its keno venue accounting records and physical cash flow at venues. Any failures to reconcile amounts must be recorded and investigated.

- 3.7.2. The keno system must have the ability to record and produce a running audit trail accurately showing all transactions.
- 3.7.3. Events in the audit trail must be kept on the system for a minimum of thirteen months and backed up offline for a period of seven years.
- 3.7.4. The audit trail must only be accessible by authorised personnel.

3.8. Keno Terminal Requirements

- 3.8.1. All keno terminal equipment must have a facility which enables identification of the manufacturer, model, build date and unique serial number of the equipment.
- 3.8.2. The design and construction of the keno terminal is to be of a sufficient standard to withstand limited abuse, vandalism or fraudulent activity by users without compromising the integrity of the equipment.
- 3.8.3. Terminal functions must not interfere or affect the integrity of the keno system or outcome of keno games.
- 3.8.4. Keno terminal operations must be able to tolerate power interruptions to the terminal without causing transactional errors or corruptions.
- 3.8.5. Keno terminals and their approved functions must be access protected and must not be capable of any function when an operator is not logged onto the terminal. All operator functions, including for training, maintenance and technical engineering purposes, must be access protected by a secure access identifier and password, or an appropriate unlocking facility.
- 3.8.6. Keno terminals must support a test or diagnostic mode which enables the testing of all critical components (eg. banknote acceptors and printers) integral to the operation of the terminal and provide on-screen verification of any associated software and/or firmware.
- 3.8.7. Keno terminals must provide for a facility that logs a terminal operator out after a set time-out period has expired. Logging back into a terminal must be performed via a terminal operator PIN, card swipe function or other method. Note: Self-service terminals are not required to support the terminal time out function.
- 3.8.8. The storage of PINs or passwords on terminals is to be in an encrypted, non-reversible form.
- 3.8.9. Keno terminals must only accept 'cash' keno ticket purchases and must not permit account based purchases of keno games.
- 3.8.10. Keno terminals must provide a means of cancelling ticket purchases for keno games that have not closed or commenced.
- 3.8.11. Keno terminals must provide a means of paying winning prizes or refunding keno games.
- 3.8.12. Keno terminals must only accept the purchase of keno tickets for game draws that have not yet commenced.

- 3.8.13. At a minimum, the following information must be available to customers concerning any purchased games placed at keno terminals:
- the game number(s) for which the ticket is active;
 - selections and/or combinations chosen;
 - an indication of which prize table was selected, if there are more than one available to the players;
 - unit cost; and
 - total cost.
- 3.8.14. Keno terminals must only permit cancellation of sold ticket(s) under circumstances where the draw for the game has not commenced.
- 3.8.15. Keno terminals must only permit payment of winning entitlements for a game after the draw relating to the game has been completed and fully processed by the central site host.
- 3.8.16. The outcome of the game must be clearly and unambiguously displayed to customers at the terminal when tickets are scanned. The terminal must provide for a customer facing display providing outcome information (ie. 'win paid', 'no win', 'win', or 'win - frozen ticket').
- 3.8.17. Keno terminals must operate in accordance with the Commission's Rules with respect to compliance with maximum cash payout limits for prizes and provide support for non-cash payout systems for the remaining balance of player entitlements via other authorised methods. Note: These include keno prize payments made via central site voucher, cheque or approved electronic banking funds transfer methods.
- 3.8.18. Unused ports on keno and other in-venue keno network devices must be disabled unless otherwise authorised by the Commission.
- 3.8.19. Keno terminal support for plug and play installation of unauthorised devices must be appropriately restricted or disabled.
- 3.8.20. A keno terminal must only be operated if it is able to correctly generate keno tickets.
- 3.8.21. Keno SSTs are only approved for use in Tasmanian casinos.
- 3.8.22. Keno terminals must be installed and operated in accordance with the Commission's Surveillance Standard.

3.9. Keno Random Number Generator Requirements

- 3.9.1. A random number generator (RNG) for use with a keno system must securely produce unpredictable outcomes.
- 3.9.2. An ATF must independently certify the suitability of any RNG algorithm.
- 3.9.3. If the RNG is a separate device, it must be connected to the keno system host via a communication medium that is physically secure and provide for the application of a tamper proof seal.

- 3.9.4. The cage, case or cabinet housing the RNG must be secure and made from a material that protects it from external interference.
- 3.9.5. The cage, case or cabinet must have the facility to apply a tamper proof seal and must not be able to be opened without breaking the seal. Note: tamper proof seals may be electronic.
- 3.9.6. All external connections (except mains power) must be fitted with tamper proof seals and disconnection must be detectable. Note: tamper proof seals may be electronic.
- 3.9.7. If the RNG is logically separated from the keno system software, its software must be totally independent of the rest of the keno system software.
- 3.9.8. All inner workings of the RNG must not be accessible by any of the other software.
- 3.9.9. Communication with the keno system software must be only through controlled means, in the same manner as if it were a physical connection.
- 3.9.10. The logical security of the RNG must be verified by an ATF to the satisfaction of the Commission.
- 3.9.11. The method of changing the RNG software within the RNG, must not be possible without the Commission granting access.
- 3.9.12. Prior approval must be obtained from the Commission each time the RNG software or hardware is to be changed.
- 3.9.13. For redundancy purposes, RNG units must be duplicated (ie. there must be at least two online RNGs available during normal keno operation at the central site host), specifically:
 - if the RNG is implemented as a physically separate RNG unit, there must be two such units; or
 - if the RNG software is contained within the keno host system, there must be logically separated instances of software.
- 3.9.14. It is required that a back-up RNG be available for disaster recovery purposes.
- 3.9.15. When the RNG has selected the required numbers that are the “result” of the game, these results must be recorded to a permanent storage device in non-volatile memory in a form that can be authenticated to detect any subsequent modification, before communication of the numbers drawn to the keno system is commenced.
- 3.9.16. Should there be some kind of communication failure before the central computer has recorded all of the required numbers, the recorded output may be used to manually complete that draw in accordance with approved procedures.
- 3.9.17. The recorded output shall show as a minimum:
 - date;
 - time (game close and draw times);
 - the keno game number;

- the numbers drawn;
 - a unique hash (that is to be entered with the numbers and checked by the keno system when manual entry of numbers is required); and
 - other security information if available.
- 3.9.18. The keno system and the RNG devices used must be designed to prevent “unauthorised devices” communicating or inserting false results to the keno system host.
- 3.9.19. Each RNG device must have a uniquely associated code which is sent to and verified by the keno system whenever the RNG establishes communication with the keno system.
- 3.9.20. The keno system may use either a software based RNG implementation of a mathematical pseudo random number algorithm and/or a hardware based RNG implementation, provided results remain unpredictable. For software based RNG implementations, Gaming Machine National Standard RNG requirements are applicable.
- 3.9.21. A hardware based RNG must not be used as standalone RNG and must be combined with other random sources of true entropy.
- 3.9.22. Where hardware based RNGs are used they must continuously seed a software RNG in a manner that avoids distribution problems and interference. An example of this is an RNG that combines hardware based output with a suitable RNG which ensures that non-deterministic output is gathered from multiple sources with entropy.
- 3.9.23. Events of chance within games must be independent (ie. uncorrelated with any other events within the keno game or any events within previous games).
- 3.9.24. Events of chance within games must not be influenced, affected, controlled or determined by anything other than (in conjunction with the prevailing payout table) numerical values obtained in an approved manner from the approved RNG.
- 3.9.25. Events of chance within games must not be automatically influenced in any way by recent history or other statistics of player, keno game or keno venue performance.
- 3.9.26. The numerical values from the RNG used to determine chance keno game events must be obtained in the normal manner and the normal sequence applicable to the type of RNG. The selection, discarding or sequence of usage of such numerical values must not be influenced in any non-approved way.
- 3.9.27. The action of background RNG generation is considered to be part of the normal operation of a RNG incorporating such a feature, and so the requirements do not preclude the existence of such a background RNG activity feature.
- 3.9.28. Prior to the commencement of each draw for a keno game, all random behaviour to be used during a keno game is to be fully determined and frozen.
- 3.9.29. Subsequent to the commencement of the draw for a keno game, no subsequent actions or decisions shall be made that will change the behaviour of any of the events of chance within the keno game play, other than player decision.

- 3.9.30. Prior to the commencement of each keno game, sufficient information is to be recorded so that all random behaviour intended for use with the keno game is able to be fully reconstructed for forensic purposes.
- 3.9.31. All pre-determined RNG information must be securely recorded. The manner of recording must be as for any other keno game replay information, that is, in an appropriately non-volatile and/or backed-up medium that will facilitate keno game replay and keno game recovery.
- 3.9.32. The RNG must not be used for any purpose other than as prescribed in approved Keno Rules.
- 3.9.33. RNG gaming equipment must be fault tolerant and capable of automatically resuming live operation, from the point of interruption during unexpected outages to ensure operational continuity and prevent foreseeable values being inserted and used in the process to predict game outcomes.
- 3.9.34. Keno systems that use an RNG must maintain a record for each game played and calculate “reasonableness” statistics on the results of the games to identify and warn the keno operator of possible non-random performance.

3.10. Keno Results Processing

- 3.10.1. After all results are received from the RNG and results have been confirmed, the keno system must perform the following actions:
- a keno results record is to be written to a log file which contains, among other things, the numbers that have been drawn;
 - if jackpots are active, the keno system must scan all active entries for this game to determine if there are any jackpot winner(s). The prize amounts for each jackpot are to be calculated as per the Keno Rules and the jackpots that have been won must be reset as per the Keno Rules. A significant event for the jackpot(s) won must be generated and reported;
 - if prorating of winners is specified in the Keno Rules, the keno system must scan all active entries for winners that might qualify for prorating (for example, large wins) as per the Keno Rules. If the sum of these prizes exceeds a limit as specified by the Keno Rules, a prorating factor must be calculated and for all of these, large prize amounts are to be adjusted by the prorating factor as per the Keno Rules. A significant event for the prorating must be generated and reported; and
 - the keno system must maintain enough information to enable all tickets that are winners in that game to be paid the correct amount when submitted for payout, regardless of whether the ticket is a jackpot win and/or prize table win, prorated or otherwise.

3.11. Requirement for Time of Day Adjustments

- 3.11.1. The keno central site host and keno systems must be capable of automatically adjusting time settings, as required, to accommodate the commencement and conclusion of daylight saving time.
- 3.11.2. Automatic time change adjustments made to the keno system must not adversely impact upon keno transactions and significant event reporting.
- 3.11.3. Keno system time of day adjustment privileges must be restricted to authorised personnel, however, time adjustments privileges shall not be limited to central site host administrator accounts.

4. Keno Game Rules and Instructions

- 4.1.1. Keno Rules, information and instructions provided by the keno system in licensed venues must be true and correct.
- 4.1.2. At a minimum, the following information must be available and conspicuously displayed to customers concerning keno games at venues:
 - current game number;
 - time until next game;
 - current jackpot amounts, if any;
 - results of the previous game, if not during a game draw; and
 - results drawn so far, if during a game draw.
- 4.1.3. At a minimum, the following information must be available to customers concerning any games played:
 - the game number(s) for which the ticket is active;
 - selections and/or combinations chosen;
 - an indication of which prize table was selected, if there are more than one available to the players;
 - unit cost; and
 - total cost.
- 4.1.4. The keno system must ensure that video displays of draw results are displayed correctly on connected equipment operating in venues.
- 4.1.5. The outcome of a keno game must be displayed for a reasonable length of time within licensed venues and must not provide false information.

- 4.1.6. At the start of each keno draw, only numbers applicable to the game number are to be displayed during a draw. Note: This requirement excludes the unambiguous additional display of previous game outcomes.
- 4.1.7. The keno system must only permit the live operation of approved pay table schedules.

5. System Documentation

- 5.1.1. The keno operator must have a security policy covered in its internal controls, rules and accounting procedures.
- 5.1.2. A keno system baseline network policy document, defining the system network topology, configuration and the communications which take place between devices in the system, must be maintained.
- 5.1.3. The keno system supplier must provide adequate documentation to the keno operator to ensure day to day operation of keno system without the supplier's guidance.
- 5.1.4. The keno operator must maintain documentation relating to the operation of any software audit control systems that are responsible for monitoring the approved state of gaming equipment.
- 5.1.5. The keno system supplier and/or its suppliers must provide a method to the nominated ATF to enable verification of the software.

6. System Backup and Recovery

6.1. System Backup

- 6.1.1. There must be a method to backup all data with sufficient frequency to allow recovery in the event of an interruption and data must be backed up for a minimum period of seven years.
- 6.1.2. If there is sensitive information in the backup data then this must be protected from unauthorised access.

6.2. Data Recovery

- 6.2.1. The keno system must retain all online data for a minimum of thirteen months.
- 6.2.2. In the event of a failure, the keno system must be able to recover all critical information from the time of the last backup to the point in time at which the system failure occurred.
- 6.2.3. The keno system must be able to recover from unexpected restarts of its central computers or any of its other components.
- 6.2.4. The keno operator must have disaster recovery capability sufficient to ensure player entitlements and records are accurate, up to the point of the disaster, are protected.
- 6.2.5. All data must be stored via secure, fault tolerant storage media and must have mirrored storage as a minimum.

- 6.2.6. It is acknowledged that third party storage providers are required to ensure hosted keno information remains adequately protected from external threats on behalf of the keno operator. Accordingly, the Commission may agree to approve third party storage premises for emergency or backup purposes but not make that information public. Under these circumstances, the keno operator will only require to provide confidential addresses of the third party locations to the Liquor and Gaming Branch.
- 6.2.7. All backup or stand-by systems shall be tested regularly to ensure proper operation of the systems.

7. Source Code

7.1. Requirements

- 7.1.1. All software development, including source code, must be well documented and commented in a manner that ensures software changes are able to be tracked.
- 7.1.2. All source code central to the operation of the keno system must be supplied to the Commission or representing ATF where the supplier has the capability, right, and access to provide source code.
- 7.1.3. Source code submissions must include all necessary hardware and/or software tools and instructions to enable the Commission or representing ATF to perform verification of source code with object code.
- 7.1.4. The Commission may also require that the keno supplier has arrangements with closed source software vendors to allow appropriate access to source code by the Commission or the representing ATF for the purpose of investigating software faults.
- 7.1.5. Closed source software must not provide functions that are central to the operation of keno. Central keno operations include, random number generation and mapping, pay table operation and prize determination, jackpot operations, software verification and other significant transactions.
- 7.1.6. The Commission or representing ATF requires the ability to separately compile the RNG source code to verify that programs used by the keno system operate identically to the programs evaluated.

8. Glossary

Term or Abbreviation	Description
ATF	Accredited Testing Facility approved by the Tasmanian Liquor and Gaming Commission and listed on the Roll of Recognised Manufacturers, Suppliers and Testers of gaming equipment under section 71 of the <i>Gaming Control Act 1993</i> .
Casino Operator	A holder of a casino licence granted and in force under section 13 or 28 of the <i>Gaming Control Act 1993</i> .
Central Keno Site	The centrally located component(s) of the keno system that controls the keno system, conducts draws and provides information and services to other components of the keno system.
Closed-source Software	Software provided by a third party, and where source code is not accessible under the terms of the software licence.
CSV	Central Site Voucher.
Commission	The Tasmanian Liquor and Gaming Commission (TLGC).
Keno Game	A game played in accordance with Tasmanian Keno Rules, as approved under section 91 of the <i>Gaming Control Act 1993</i> .
Firmware	The layer of fixed programs and data structures between the software and hardware that internally controls the hardware and electronic devices.
Gaming Operator	A holder of a gaming operator licence granted and in force under section 13 or 28 of the <i>Gaming Control Act 1993</i> .
Hardware	All physical components (electrical and mechanical) making up the keno system.
Hash	A value that is generated from a hashing algorithm for the purpose of software authentication.
Jackpot	An arrangement where contributions are made to a special jackpot prize pool from which payments, either as cash or merchandise, are made to players.
Keno Operator	A keno gaming operator.
LAN	Local Area Network.
Licensed Premises Gaming Operator	A holder of a licensed premises gaming licence granted and in force under section 31 of the <i>Gaming Control Act 1993</i> .
PIN	Personal identification number.

Prorating	Circumstances where prizes in a keno game are reduced, due to an excess of winners during that game, in accordance with the Keno Rules.
PSD	Program storage device.
RAM / NV-RAM	Random access memory is a type of computer memory that can be accessed randomly. NV-RAM or non-volatile RAM is a category of random access memory that retains stored information, even if the power is switched off.
RNG	Random number generator, which is an electronic device approved by the Commission for the purpose of generating random selection of numbers in a game of keno.
RTP	Return to player. The total wins paid to customers (including jackpots and prizes) expressed as a percentage of the total turnover of the keno game.
Seed	An input parameter used in conjunction with a hashing algorithm to generate a hash result for the purpose of software authentication and/or the generation of unpredictable random numbers.
Source Code	Is the set of instructions and statements written by a programmer using a computer programming language. This code is later translated into machine language by a compiler. Open source code refers to software for which source code is available. Closed source code refers to software provided by a third party, and where source code is not accessible under the terms of the software licence.
SST	A keno self service terminal. A device used by customers for paying for and cancelling purchases of transactions associated with the game of keno.
Supplier	A person who provides the keno system and is listed on the Roll of Recognised Manufacturers, Suppliers and Testers of gaming equipment under section 71 of the <i>Gaming Control Act 1993</i> .
Terminal	A keno terminal device used by licensed persons for selling, paying and cancelling purchases of transactions associated with playing the game of keno.
WAN	Wide area network.

9. Version Control

Version	Date	Changes Made
1.0	1/6/2020	New standard created.

