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Issuing Laboratory:	GLI Europe B.V.
Evaluating Laboratory:	GLI Europe B.V.
Report Recipient:	Playtech Limited 2 nd Floor St. George's Court Upper Church Street Douglas Isle of Man, IM1 1EE
Jurisdictions:	Non Jurisdictional
Technical Standards for Testing:	<ul style="list-style-type: none">• Remote Gaming Regulations, 2004, Third Schedule – Technical Requirement for Gaming System (Malta).• Ouverture à la Concurrence et à la Régulation du Secteur des Jeux D'Argent en Ligne. Dossier des Exigences Techniques (France Online).• Technical Standards and Guidelines for Internal Control Systems and Internet Gambling Systems v3.2, 29 March 2012 (Alderney).• Spillemyndigheden's technical standards Version 1.3.0 of 1 July 2012, Category A (Denmark Online).• Resolution dated 16th November 2011, the General Directorate of Gaming Affairs whereby approving the provision by which the development of technical specifications must comply with the gaming technical systems object of licenses granted under Law 13/2011 dated 27th May, of gaming regulation. Royal Decree 1613/2011, dated 14th November 2011, which develops the Law 13/2011 dated 27th May of gaming regulation, regarding the technical requirements of gaming activities (hereinafter RD_TEC) (Spain Online).• Decree of 10th January 2011 - Governance of games of skill and games of chance with fixed odds and non tournament card games with remote participation (Italy Online).
Software Supplier:	Playtech Limited 2 nd Floor St. George's Court Upper Church Street Douglas Isle of Man, IM1 1EE
Submitting Party:	Playtech Limited 2 nd Floor St. George's Court Upper Church Street Douglas Isle of Man, IM1 1EE
Product Tested:	Playtech Poker Random Number Generator (RNG)
Evaluation Period:	27 April 2012 / 27 August 2012
File Number:	RN-400-PTC-12-01
Testing Result:	Subject to the Conditions of Evaluation (pages 8 and 9): Complies
Report Sections:	<ul style="list-style-type: none">- Software Product Details- RNG Evaluation- Conditions of Evaluation- Terms and Conditions



Software Product Details

GLI tested the Playtech Poker RNG against the Technical Standards of the following jurisdictions: Malta, France Online, Alderney, Denmark Online, Spain Online and Italy Online as regulated by: the Lotteries and Gaming Authority (LGA), Autorité de Régulation des Jeux en Ligne (ARJEL), Alderney Gaming Control Commission (AGCC), Spyllemyndigheden, General Directorate of Gaming Affairs and Amministrazione Autonoma dei Monopoli di Stato (AAMS), respectively.

For version-control of the Playtech Poker RNG, GLI gathered Message Digest Five (MD5) checksums of the following software files in the Playtech Poker RNG:

File Name	Package	MD5 Checksum	SHA-1 Checksum
DriverManager.class	com.playtech.rng	87558A35 F079E712 4F0A2009 FBB1B236	1DCFBB85 BF3BC50A FCBCA564 C617CC80 2D213063
DriverManager\$1.class	com.playtech.rng	24E02A4D D7312B90 FF8897EE 927B69C9	14B6E585 F928A066 A1BB1FCD 4F90B945 1BA52376
IRngDriver.class	com.playtech.rng	42A0D103 E652C627 F5556A3F 76D864FE	5B3CA3A3 9BACA2C8 8127EE03 642B6A1C 2AE09F8C
RngDriver.class	com.playtech.rng	FC364541 863E3253 AD4A36F4 C88B25C7	AF8C79FD 15DAFED9 BD850A8C 32143E43 AC8C9B3B
RngDriverException.class	com.playtech.rng	19B1F253 D154BF39 DCF67EB7 243FFE9E	95188226 2E268F58 1F237E2F C6F4C8D2 070455E0
RngServer.class	com.playtech.rng	9D8DB982 80A97D3A B882BB85 F7D493B2	67AC3F9F 382026F2 A960C522 64B5FAC3 A93D3D27
BitUtils.class	com.playtech.rng.sg100	4A067C8B 7E5333CD B1F7CE17 9AF57F01	B266E303 FE831A4C 98EDBE8A 08CA8DEC 8187D52A
FrequencyAnalyzer.class	com.playtech.rng.sg100	2D356F30 0681E828 35B2026A 597F6D8B	D8DFC476 DC578AAD A6066005 56B6F40E F8FDF1B2



Software Product Details

For version-control of the Playtech Poker RNG, GLI gathered Message Digest Five (MD5) checksums of the following software files in the Playtech Poker RNG (continued):

File Name	Package	MD5 Checksum	SHA-1 Checksum
IRandomConsumer.class	com.playtech.rng.sg100	7CB128DD CDED2EFA 07E4BF38 31F64C05	B58CBF7A B6FFD1DF 814D656B 2E9E1FC4 89DC5ED2
NoiseBufferHelper.class	com.playtech.rng.sg100	51EFE9E8 698C0A68 2E6BB5A0 425CD2E8	74F35047 617CC244 BF23EA42 D46750D4 D37DCEA0
SG100Driver.class	com.playtech.rng.sg100	49915FD7 4B27E686 70F77318 01050D0D	92482424 8E681384 5126D387 2DFB3354 5B988D2E
ComPortOptionHandler.class	com.playtech.rng.sg100.telnet	FF09331E CE438B13 307C5425 BF217669	CC3E4D58 F328D9E6 1A93FCEE BDBEE513 C9CAEB6C
PtTelnetClient.class	com.playtech.rng.sg100.telnet	D2EC233F C118AEA0 22D22FB8 DF042380	EA5C435F E5CF4B26 621E654F FE4F348F E1956D6E
ReverseTelnetDriver.class	com.playtech.rng.sg100.telnet	969E41D3 EC78F3F1 8EF0CB78 69AE8FB4	941DA2BC 50A43606 BE554763 981599D1 37416DE7
ReverseTelnetInterface.class	com.playtech.rng.sg100.telnet	E4FA8EF6 092078B9 B7B776C7 40CAF549	37714F0A 16D743EC B7662966 FB609A26 66F41923
AbstractRngClientSession.class	com.playtech.rng.external	51794E3F 9AEEF944 8D78CFA2 BD5C0EB0	B92DBAA4 E37C08A2 A9A5A7D6 1CD30BC6 E26F73C4
GameServerSession.class	com.playtech.rng.external	CCBA72B0 9376068C 28A57549 B64159B1	8FA9E712 2F6989BB 6C2291FB 9A2FD562 D617F2DD



Software Product Details

For version-control of the Playtech Poker RNG, GLI gathered Message Digest Five (MD5) checksums of the following software files in the Playtech Poker RNG (continued):

File Name	Package	MD5 Checksum	SHA-1 Checksum
RngMonitoringTraps.class	com.playtech.rng.monitoring	9DF2AC1C A22862F3 35241640 9187D95F	FCA7024C 5A7B5F81 1EC7C5F5 7E87AC1A 3DEC7C3C
AbstractGameRules.class	com.playtech.poker.rules.game	1EA30E6D B49344FA F86DDC23 87BD26E0	DC5B8962 EA23957F 6228E544 8C7A2DF6 7E043F49
Deck.class	com.playtech.poker.rules	29C45F43 EC360EE4 DC782240 2DB8182D	43AD651A 3FEBFEAD 6C61B246 0E31AE97 DB662748
RealShuffler.class	com.playtech.poker.rules	83D9D661 07E331FF 5C2CA4C8 FEA02D1E	4A80FD7E E86EE3D3 2A961BB1 54282ABB DD6F6DBA
BufferLevel.class	com.playtech.common.util.rng	37F0043A 75D76158 FED01381 B49A4FB1	CAA8168A 9A7969CB D15D8922 74050178 C1D19F38
BufferLevel\$Level.class	com.playtech.common.util.rng	E5C50C8D E00335C3 B16724AB 6EB55399	94D89E98 C3720B25 02DF77F2 86CFFA85 E8FB4017
RandomReader.class	com.playtech.common.util.rng	430FAFBC 5DBAF4DC 12BAB7E2 F3233BE9	C6DD80F9 D36B47D1 3C91AA5A 4CABF6A5 EE5229DB
RandomX.class	com.playtech.common.util.rng	E4EF56A8 03400A2D 69A56674 A34C3ED8	1DD518B5 81953D26 DC025207 0A5F0499 5B1BA6C8
IRandomBuffer.class	com.playtech.common.util.rng.impl	C9ACDCCF C7A5E285 6DD011A8 12CC8B2F	C8D90A32 F61EF626 43ECDEBB 8CEDC6C3 2A7F545F



Software Product Details

For version-control of the Playtech Poker RNG, GLI gathered Message Digest Five (MD5) checksums of the following software files in the Playtech Poker RNG (continued):

File Name	Package	MD5 Checksum	SHA-1 Checksum
RandomBatch.class	com.playtech.common.util.rng.impl	C00C3C83 319239B4 936B0CB2 6287839D	B3E3B188 8AF2258C C19A957B D0B0ECC1 5B42B7BA
RandomBuffer.class	com.playtech.common.util.rng.impl	E8E4E781 DEA424F5 38D8FD78 47082723	40031DBB 1C22C066 4A24659F 60F6BFAE 2739E5B7
RandomBuffer\$1.class	com.playtech.common.util.rng.impl	CE3DF678 CB769550 48E43478 0F7B6797	4E3EBA47 AB760005 8A80D4F8 B9AA7F96 A6D7359F
RandomReaderImpl.class	com.playtech.common.util.rng.impl	630BA54C 66D168FA D619E0DE 944AB2A8	00E70ADC D3D9583F 9B89D4F8 8EFC76FB E2253533
RandomXImpl.class	com.playtech.common.util.rng.impl	EB60ACB5 D0EF48F7 7104422B D9BF5759	8CFEB64C A7955B64 90259D71 1A3BCD0E 21251982
RandomXWrapper.class	com.playtech.common.util.rng.impl	0F2D4B32 003B2730 C8E59D70 76B7E175	41BBB6E1 5747B253 F868D77F 538E5B23 A8DB09C0
RandomY.class	com.playtech.common.util.rng.impl	AECED110 16A308AA 4FFB8B94 6F887323	D3F960F1 69B122D5 D4CC1561 97881819 C90832A2
RandomProvider.class	com.playtech.common.rng	0E0CFB89 279C3316 AC84F27B 2432E5C1	FF2CB7D7 9CE8D876 1BE24E33 97EC3A24 E3A023CE



RNG Evaluation

GLI's RNG Evaluation included (but was not necessarily limited to) the following elements:

- General RNG Analysis,
 - Submitted Documentation Review,
 - Source Code Read,
 - Review Of Test Plan,
 - Review Of Test Results,
 - Jurisdictional Review Of RNG Design,
 - Data Generation,
 - Data Analysis,
- Final Outcome Distribution Tests.

GLI has verified, through mathematical and statistical analysis, that the Playtech Poker RNG distributes numbers with sufficient non-predictability, fair distribution and lack of bias to particular outcomes. GLI's statistical analysis of the scaled outcomes of the RNG was performed using confidence intervals of 95%, 98% and 99%, which are documented intervals of confidence for such statistical analysis.

GLI has not evaluated the mapping between the scaled RNG outcomes and the presentation of these outcomes to the player. Moreover GLI has not evaluated the random selection process of the game outcomes against the game rules presented to the player. GLI's testing has shown that the Playtech Poker RNG produces an acceptable source of random numbers for the following configuration being used in the evaluated games.

The table below summarizes the results of GLI's statistical testing of the output of the RNG.

Data Set	Data Type	Range		# of Selections	Replacement	Samples	Result
		Minimum	Maximum				
1, <i>f</i>	Standard 52-card Deck	0	51	52	No	55,000,000	PASS
2	Binary Data	0	255	1	N/A •	12,000,000 „	PASS

- Not applicable, because only one selection per sample was made.
- , For each sample pairs of consecutive selections were combined into single unique values for the purpose of conducting a Poisson Distribution Test.
- f* Two subsets were created from set 1 by taking selections 1-26 and 27-52 from each sample. These subsets were created for the purpose of conducting the Adjacency Blocks Test, Adjacency Max-Min Test, Overlaps Test and Total Distribution Test.
- „ Note three sets of data containing this sample size were obtained and analyzed.



RNG Evaluation

The following tests were applied to these sets of data where applicable:

Test	Sets to which this test has been applied
Data Format Check (To ensure that the data conformed to the parameters given in the table above)	all sets
Chi-Square Test	1
Runs Test	1
Serial Correlation Test	1
Interplay Correlation Test	1
Adjacency Blocks Test	1
Adjacency Max-Min Test	1
Adjacency Hi-Low Test	1
Duplicates Test	1
Overlaps Test	1
Permutation Test	1
Poisson Distribution Test	1
Total Distribution Test	1
Total Distribution By Columns Test	1
Vertical Coupon Collector's Test	1
DIEHARD Battery of Tests ¹	2

Please note:

- The Playtech Poker RNG makes use of a SG100 hardware device as a source of random entropy. Such a device uses quantum physics as a source of entropy for the algorithm that produces the final numbers. The specific SG100 devices used by GLI to collect RNG test data are not distinguishable in the field. It is the responsibility for Playtech to assure that the SG100's provided to the jurisdiction for use in conducting drawings are functioning correctly and in the same manner as the ones made accessible to GLI to gather test data.
- Please note that a single SG100 hardware device was used for RNG testing purposes. Clearly, GLI cannot test each SG100 manufactured and therefore cannot attest to the randomness of each manufactured SG100 device for its particular application. However, it should be expected that each SG100 is designed using a defined specification that ensures comparable design attributes.

¹ Marsaglia, George. "The Marsaglia Random Number CDROM including the Diehard Battery of Tests of Randomness." Department of Statistics and Supercomputer Computations Research Institute. 1995. Florida State University. <<http://www.stat.fsu.edu/pub/diehard/>>



Conditions of Evaluation

GLI's compliance evaluation of the Playtech Poker RNG is subject to the following conditions:

- The recipient, by its acceptance of this report or analysis, will be deemed to have acknowledged and agreed to all of the "terms and conditions" set forth below. If the recipient does not agree to all of such terms and conditions, GLI withdraws the certification provided or analysis established by this report and the recipient must immediately return to GLI all copies of this report and make no reference to this report for any purpose at any time.
- This non jurisdictional report is not intended to represent the final report for any of the mentioned jurisdictions, it is for informational purposes only.
- GLI's compliance evaluation of the Playtech Poker RNG was related only to the technical scope of work elements discussed herein. This specifically excludes any other features or functions provided by the submission not related to these elements.
- All testing results are based on information and materials submitted by the Playtech Poker RNG to GLI throughout the duration of the project. There are inherent limitations to performing compliance testing within a laboratory environment, and within a finite time period. As a result of these limitations, anticipating all possible configurations, scenarios and events which could potentially occur in the live environment was not feasible.
- GLI's evaluation to the Technical Standard was limited only to the requirements applicable to the Playtech Poker RNG. In addition, the following sections of the applicable Technical Standard were excluded from the scope of work for this evaluation:

Technical Standard Section(s)	Reason for Exclusion
(Malta) All sections except sections 3a-c, 4 and 5.	These sections are not applicable to RNG's.
(France Online) All sections except section 5.2.	These sections are not applicable to RNG's.
(Alderney) All sections except section 4.3.	These sections are not applicable to RNG's.
(Denmark Online) All sections except section 4.9.	These sections are not applicable to RNG's.
(Spain Online) All sections except sections 3.5.1, 3.5.2, 3.5.3, 3.5.4, 3.6.1 and 3.6.2.	These sections are not applicable to RNG's.
(Italy Online) All sections except sections 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6, 2.5.6.1, 2.5.6.2, 2.5.6.3 and 2.5.7.	These sections are not applicable to RNG's.



Conditions of Evaluation

- GLI generated the checksums of the software and source code files using the methods stated below:

GLI Verify® - Verification Procedure for Files or Directories:

1. Open GLI Verify®.
2. Select the 'File' or 'Directory' radio button option.
3. Select the 'Browse' button and then choose the file or the top directory for which a signature is being requested.
4. Click the "Verify" button.
5. The current file/directory being checked will be displayed in the window.
6. The program will generate a CDCK, SHA-1 and MD5 signature and display the results in the centre window.

GLI Verify® V5.2 is an application developed by **Gaming Laboratories International, LLC** (GLI) to generate CDCK, SHA-1 and MD5 signatures on files, folders, DVD, CD and Compact Flash media. GLI Verify® V5.2 can be downloaded from GLI's website at www.gaminglabs.com.

Or contact GLI Compliance at:
1-888-GLI-REGS (454-7347) or
E-Mail at compliance@gaminglabs.com.



Subject to the **Conditions of Evaluation**, GLI has determined that the Playtech Poker RNG **complies** with the requirements of the applicable Technical Standards.

If you should have any questions regarding this information, please feel free to contact our office.

Sincerely,

Mr. Martin Britton
Managing Director



Terms and Conditions

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If you should have any questions regarding this information, please feel free to contact our office.

Sincerely,
GLI EUROPE BV