

# RGS EVALUATION TESTING REPORT

## Compliance testing report

*Test Item: RTP Live Monitoring*

*Python and sql Application*

*vers. 1.0*

### Reference regulation:

UK Gambling Commission - *Remote gambling and software technical standards*, July 2015

*Testing strategy for compliance with remote gambling and software technical standards*, May 2016

**November 29<sup>th</sup>, 2016**



## INTRODUCTION

The findings reported in this summary are the results of a broader set of documents and testing activities results archived in Quinel M's facilities. It is intended that the requester declares that:

- Any Hardware provided or described for analysis and testing is configured identically to hardware in commercial use
- Game software/ function provided for the testing and code review is declared by the customer to have the same behaviour to the software/code in commercial use
- Functionality made by the software in automatic test mode has a realistic behaviour

and that

- all the files and modules,
- the database schemas and all the specific programming resources,
- all the parameters contained into any databases and/or configuration file

that have been subject to the audit process guarantee the same behaviour of what is going to be published/deployed according to this audit results.

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### A) Audit ID

J16110144\_I001\_RTP Live Monitoring\_1.0\_rev. 1

### B) Reference regulation

UK Gambling Commission - *Remote gambling and software technical standards*, July 2015

### C) Test methods

QIVI001 – Visual inspection  
 QISI001 – Software source inspection method  
 QIMT001 – Mathematical analysis

### D) Auditor / Test lab

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 Marina Court, Flat 8,  
 Triq Giuseppe Cali',  
 XBX 1421 Ta'Xbiex - Malta  
[info@quinel.com.mt](mailto:info@quinel.com.mt)

### E) Audit subject / Scope

**Description:**

Compliance of the following test items:

**Test Item(s):**

Test Item	Game Name	Version (plus SVN revision)	Interface
I001	RTP Live Monitoring	1.0	Python and sql Application

**Receipt date:**

- 07/09/2016 – first submission for testing against UKGC regulation as per Section (B)

**Inspection date:**

07/09/2016 - 29/11/2016 (against UKGC current regulation as per Section (B) )

### F) Requester

THUNDERKICK MALTA LTD  
 Level 5, The Mall Complex,  
 The Mall Floriana FRN 1470 Malta

## G) Owner/Producer of the system/software

Ref. to Section F)

## H) Companies and organizations involved in the process

**Producer(s):** Ref. to Section G)

**Requester:** Ref. to Section F)

**Licensee/Operator:** N.A.

## I) Individuals involved in the process

**On the Requester side:** Mr. Sven Grip, Mr. Johnny Aspelin, Mrs. Jeanette Karlsson, Mr. Peter Nilsson.

**On the Producer(s) / Integrator(s) side:** same as for Requester

**On the Licensee/Operator side:** N.A.

## J) Processes, rules and parameters of the games / Limitation of use

None

## K) Specifications of the gaming system

Games, platform and RNG are developed with the Java language, while the RTP Live Monitoring tool is a Python and sql application

### Monitor and event handling

#### Daily monitoring:

- The RTP is monitored on a daily basis. The daily monitoring is based on time series going backwards until the sufficient amount of data has been sampled.
- Normalized RTP is the focus area for daily alerting to mitigate the risk of using to large amount of sampled games.
- Initially this will be sampled by game but as data increase, the monitoring will be further separated into distribution channel (mobile/desktop) and/or operators.

#### Alarm and deviations:

- If any deviations occur, an internal mail is sent as an alert.
- An incident is registered internally and an investigation initiated.

- Investigation of the alert is performed immediately by reviewing of the sample and sample count. Perform simulations to investigate if the threshold values are set too low/high. If no significant failure is detected, the incident is closed and all analysis data is keep for future reference.
  - If the analysis of the discrepancy is caused by any failing component, the affected game is shut down immediately and operators and UKGC is alerted.
- Monthly reporting**
- The monthly report includes the actual RTP (both normalized and non-normalized) based on the rounds data for the applicable month. Also, as a reference, the RTP is presented where the minimum sample count has reached the normal distribution.

## L) Critical modules

None

## M) Evaluation performed

The test evaluation, required by the Requested, was completed against the current “Testing strategy for compliance with remote gambling and software technical standards” and the “Live RTP performance monitoring of games of chance” consultancy page made available by the UKGC in the following link: <http://www.gamblingcommission.gov.uk/Technical-standards/Live-RTP-monitoring-of-games-of-chance.aspx>

Refer to the Annex I for a full detailed list of requirements tested.

## N) Testing activities applied

- Source code inspection
- Mathematical analysis
- Simulation and inspection for verification of the actual RTP Live Monitoring process

## O) Additional information

None

## P) Product Tested

Quinel M has evaluated the procedure of monitoring, reporting and logging of the RTP Live Monitoring Tool implemented by the Requester. Source code inspection and documentation analysis was performed on the files listed below:

SHA1	File name	Critical	Test Item
fc3c5393801cc3df6dc047b6f3841067b07b3d81	alerts\Incident registration.pdf	N	I001
dece7b41c57acd726018012098dabeccf6bb52e	alerts\OP5Alert.pdf	N	I001
cc05fb79b8d186f75028c7917584ff8ea5c92a7e	alerts\op5AlertRecovery.pdf	N	I001

c5106d3d949b664e73056d7918acb66c038c47ef	alerts\RTP_Alert_from_monitor.pdf	N	I001
6c8b39b10f9920b48ba5f104bfc300c06db4ce4a	logs\rtpcollector_monitor	N	I001
90d979baaaed947450911e52440d9780a6b188d	logs\rtpdatacollector.log	N	I001
f10a41ad0299f8ede33658297a18a1d7b8e368b8	logs\rtpmonitor.log	N	I001
321eefadba8f98f0fa528e6a36c5f84f4d346de9	logs\rtpmonitor_monitor	N	I001
018564cfa3fc4273b9cafd68d7ce70a0dfaa8d3c	readme.txt	N	I001
770a824e0dfbac998bdb8dc2a9dcebd80e8fa826	current_rtp_test_input_values.PNG	N	I001
0ab53fee3e03c0d6957ab68407ab41aac9c96602	Operations-How-to handle RTP alarms.pdf	N	I001
93de05415ae4057719d36a1fcb5b6f00b23de781	Operations - Process description of RTP monitoring.pdf	N	I001
a708ee8b1143ba3fa64eefd6067702f3a4c37bbb	rtp_data_collector.py	N	I001
6b5e0d1a36f0507188c3e988ce2726aa67216774	rtpmonitor.py	N	I001
3e89a12cd093c330d6837b6ae48b70623057d1b9	getRtpData_procedure.sql	N	I001
868748cc3faf97494e0999380963440ff26f782a	RTP Alarm Analysis template.xlsx	N	I001
ea603b15078ae80e1e82844c63007408ff539c60	Analyse alarm sql script.sql	N	I001

## Q) CERTIFICATION

Date: November 29<sup>th</sup>, 2016  
Job ID: J16110144\_I001\_RTP Live Monitoring\_1.0  
Requester: THUNDERKICK MALTA LTD  
Level 5, The Mall Complex,  
The Mall Floriana FRN 1470 Malta

Total Number of Pages: **11**

QUINEL M LTD certifies that the test item identified at section E)

I001: RTP Live Monitoring tool 1.0 (Python and sql Application)

complies with the current "Testing strategy for compliance with remote gambling and software technical standards" and the "Live RTP performance monitoring of games of chance" consultancy page made available by the UKGC.

Refer to the Annex reports for the full list of requirements satisfied.

## R) CONDITIONS

None.

## S) CONCLUSIONS

The test item identified at section E) complies with the relevant requirements of the above mentioned Technical Standards and Testing Strategy

Date: November 29<sup>th</sup>, 2016

**Signed:**



Matteo Ferrarini – Laboratory Technical Director  
Chief Operation Officer (QUINEL M)

## ANNEX I – REQUIREMENTS SATISFIED

### Definitions

<b>Compensated games or events</b>
Games or virtual events that adjust the likelihood of winning outcomes occurring based on previous payouts or intake. Sometimes referred to as adaptive behaviour or percentage compensation.
<b>Game</b>
A game of chance as defined in section 6(2) of the Act
<b>Instant lottery</b>
A lottery in which the draw takes place before any of the tickets in the lottery are offered for sale.
<b>Mapping</b>
Is the process of selecting an outcome using the result from a Random Number Generator (RNG). For example, the result from a RNG is mapped to a reel strip symbol.
<b>Lottery</b>
As described by section 14 of the Act.
<b>Lottery ticket</b>
As described by section 253 of the Act and a reference in this document to a lottery ticket includes: <ul style="list-style-type: none"> <li>• a lottery ticket which is sent by post following entry by means of remote communication</li> <li>• a message sent or displayed to a person electronically in a manner which enables him to (a) retain the message electronically or (b) print it.</li> </ul>
<b>Non-commercial society</b>
As described by section 19 of the Act.
<b>Peer-to-peer gambling</b>
A type of gambling where customers gamble against each other rather than against the house. For example, equal chance gaming such as poker or peer-to-peer betting through betting exchanges.
<b>Progressive or progressive jackpot</b>
An incremental prize that increases as a result of contributions from the monies staked within a game from pre-set base value.
<b>Random Number Generator (RNG)</b>
Refers to any item of hardware or software which is used to generate random numbers with the intended property of statistical randomness.
<b>Restricted display device</b>
A device such as a mobile phone or personal digital assistant which has limited space on which to display information, when used to access gambling facilities that the operator intends a customer to use by means of such a device.
<b>Scaling</b>
Scaling is the process used to convert the output from a RNG into the format required to produce a result for a particular gambling product. To illustrate, an RNG may produce a result of between 1 and 100,000 but these possible outcomes need to be scaled to the potential game outcomes of, for example, between 1 – 52 (i.e. to correspond to a standard pack of cards).
<b>Seeding</b>
Refers to the process used to determine the initial state of the RNG.
<b>Subscription lottery</b>
A series of lotteries (other than instant lotteries) promoted on behalf of the same non-commercial society or local authority in respect of which participants pay for participation in one or more future lotteries by



regular subscription over a fixed or indefinite period.
<b>Telephone gambling</b>
Gambling which takes place via a telephone, without the use of visual displays, by interaction with a customer service agent or an automated system, such as intelligent voice recognition systems or touch tone.
<b>Virtual</b>
As described by s353(3) of the Act. Virtual event and virtual game are to be construed accordingly.

Unless differently specified, the results are related to all the test items.

Requirements			Result
RTS	Aim	Req.	PASS / FAIL / N.A.
RTS 1	To provide customers with easily accessible information about their current balances	A	N.A.
		B	N.A.
RTS 2	To enable the customer to understand the value and content of their transactions.	A	N.A.
		B	N.A.
RTS 3	To enable customers to make informed decisions about whether to gamble based on their chances of winning, the way the game, lottery or event works, the prizes or payouts on offer and the current state of multi-state games or events.	A	N.A.
		B	N.A.
		C*	N.A.
		D	N.A.
RTS 4	To reduce the risk that customers are unfairly disadvantaged by technical factors that may affect speed of response, where response time has a significant impact on the likelihood of winning.	A	N.A.
RTS 5	To ensure that the gambling system implements the operator's rules, game rules and betting rules as they are described to the customer.	A	PASS (*)
RTS 6	To minimise the risk that customers are misled about the likelihood of winning due to the behaviour of play-for-fun games.	A	N.A.
RTS 7	To ensure that games and other virtual events operate fairly.	A	N.A.
		B	N.A.
		C	N.A.
		D	N.A.
		E	N.A.
RTS 8	To ensure that the customer is still in control of the gambling where auto-play functionality is provided.	A	N.A.
RTS 9	To minimise the risk that auto-play functionality disadvantages a customer or that autoplay or other strategy advice is misleading.	A	N.A.
RTS 10	To ensure that customers are treated fairly in the event of interrupted play or betting and that they are aware of how they will be treated if interruptions occur.	A	N.A.
		B	N.A.
RTS 11	To reduce the risk that cheating or collusion by players unfairly disadvantages another player.	A	N.A.
RTS 12	To provide customers with facilities that may assist them in sticking to their personal budgets for gambling with the operator.	A	N.A.
		B	N.A.
RTS 13	To provide customers with facilities to assist them to keep track of the time they spend gambling.	A	N.A.
RTS 14	To ensure that products are designed responsibly and to minimise the likelihood that they exploit or encourage problem gambling behaviour.	A	N.A.

Requirements			Result
IPA	Aim	Req.	PASS / FAIL / N.A.
IPA 1	To provide customers with facilities that enable them to review previous gambling and account transactions.	A	N.A.
IPA 2	To inform customers who choose to use third party user-interfaces that they may not receive full information about their gambles.	A	N.A.
IPA 3	To make the customer aware that they may not have the latest information available when betting on live events, and that they may be at a disadvantage to operators or other customers who have more up-to-date information.	A	N.A.
IPA 4	To make customers in peer-to-peer(s) gambling aware that they may be gambling against a software program (designed to automatically participate in gambling within certain parameters), rather than another (human) participant. This software is sometimes referred to as a robot or bot.	A	N.A.
		B	N.A.
IPA 5	To make the customer aware that they may be at a disadvantage due to technical characteristics, such as slower network connections or lower end user device performance, if they are participating in a time-critical form of gambling (where the customer's speed of interaction influences their chance of winning).	A	N.A.
IPA 6	To inform customers about the operator's policies with regard to service interruptions and how they are likely to be treated if interruption occurs so that they may make an informed decision about whether to gamble and in what way.	A	N.A.
IPA 7	To inform customers about the risks posed by collusion/cheating and to deter individuals from attempting to cheat.	A	N.A.

(\*) RTP Live Monitoring

**END  
OF  
COMPLIANCE  
REPORT**