Certification Report	Pariplay Game Audit Report - Bloodshot Rising Spirit
Report Identification	PRP-MT-200220-01-GC-R1
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Report prepared for	Pariplay Ltd Clinch's House, Lord Street Douglas IM99 1RZ Isle of Man
Jurisdiction	Malta Gaming Authority Malta
Technical Standards used for testing	Remote Gaming Regulations 2004, Legal Notice 176 of 2004 of the Lotteries and other Games Act (ACT XXIV OF 2001), 20 April 2004

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1 Notations

1.1 Confidentiality

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1.2 Disclaimer

ga has reported on what it has discovered through evaluation of Pariplay's game Bloodshot Rising Spirit.

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2 Administration

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2.2 Version

Version	Description	Date
V0.1	Initial draft – SALI	2020-02-13
V1.0	QA - BPHU	2020-02-20

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3 Executive Summary

3.1 Introduction

Pariplay Ltd. (Pariplay) has requested Gaming Associates (**ga**) to test their game, Bloodshot Rising Spirit against the compliance requirements of the Remote Gaming Regulations 2004.

ga has tested Pariplay's game Bloodshot Rising Spirit against the Malta Gaming Authority (MGA) compliance requirements listed in Section 3.2 Scope of Testing. This report presents the results of testing performed by **ga** for the Bloodshot Rising Spirit game. Hashes of the game are listed in Annex A: SHA-1 Hashes.

3.2 Scope of Testing

The scope of testing is to verify compliance against the following requirements of the "Remote Gaming Regulations 2004, Legal Notice 176 of 2004 of the Lotteries and other Games Act (ACT XXIV OF 2001)", dated 20 April 2004:

- Third Schedule Regulation 25: Technical requirement for gaming system.

This compliance evaluation does not include evaluation of the Random Number Generator (RNG).

3.3 Testing Limitations Due to the Test Environment

Since Bloodshot Rising Spirit has been tested in a test environment, the following Malta Gaming Authority requirements could not be tested and need to be verified when the game is integrated with a gaming platform:

- 2. Both the gaming and financial transactions must be congruent and secure.
- 6 (b) - The gaming system must be able to display for each game the following information on the current page or on a page directly accessible from the current page via a hyperlink:- (b) restrictions on play;
- 7. All financial reports produced by the gaming system must be congruent with gaming transaction reports and conversely: Provided that all such reports shall be readily and freely available to the Authority.
- 8. The gaming system must:- (a) be capable of producing monthly auditable and aggregate financial statements of gaming transactions, and (b) calculate accurately all taxation and other monies due to the Authority.
- 10. The gaming system must maintain information about significant events as follows:-
  - (a) large wins;
  - (b) transfers of funds in excess of such amount as the Authority may from time to time direct by notice in writing to the operator;
  - (c) changes made by the operator to game parameters.

3.4 Conclusions and Recommendations

Pariplay's game Bloodshot Rising Spirit complies with the requirements of the "Remote Gaming Regulations 2004, Legal Notice 176 of 2004 of the Lotteries and other Games Act (ACT XXIV OF 2001)", dated 20 April 2004. However, some requirements, identified in Section 3.3 of this report, need to be verified when the game is integrated with a gaming platform.

ga recommends Pariplay's game Bloodshot Rising Spirit to be approved for integration with gaming platforms already approved by the MGA.

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4 Test Results

This section summarises the results of the tests performed on Pariplay's game Bloodshot Rising Spirit. The tables in the following sub-sections provide the compliance status of the game against MGA requirements listed in [1]. Different values used in the "System Compliance" column are described as follows:

Compliant: The game complies with the requirement.

Does Not Comply: The game does not comply with the requirement.

Acknowledged: The requirement is only a statement or information.

N/A: The requirement is not applicable to the game.

Out of scope: The requirement cannot be evaluated at this stage due to the current scope of testing or limitation of the test environment.

4.1 Third Schedule Regulation 25: Technical Requirement for Gaming System

Malta Requirements	System Compliance	GA Comments
Third Schedule		
Regulation 25: Technical requirement for gaming system		
1. The gaming system must:		
(a) faithfully follow the game rules published by the operator; and	Compliant	The game instructions are available and the game operates and interacts with the players in accordance with the game instructions.
(b) Provide over time no more than the expected house advantage to the operator.	Compliant	The game instructions are available and the game operates and interacts with the players in accordance with the game instructions.
2. Both the gaming and financial transactions must be congruent and secure.	Out of scope	Could not be verified because the game has not been integrated with a gaming platform.
3. The gaming system must satisfy the following criteria for randomness, following Schneier:-		
(a) the data must be randomly generated, passing appropriate statistical tests of randomness;	Out of scope	Evaluation of the RNG is out of scope.
(b) the data must be unpredictable, i.e. it must be computationally infeasible to predict what the next number will be, given complete knowledge of the algorithm or hardware generating the sequence, and all previously generated numbers;	Out of scope	Evaluation of the RNG is out of scope.
(c) the series cannot be reliably reproduced, i.e. if the sequence generator is activated again with the same input (as exactly as is reasonably possible) it will produce two completely unrelated random sequences.	Out of scope	Evaluation of the RNG is out of scope.
4. The outcome of any game event, and the return to the player, must be independent of the CPU, memory, disk or other components used in the playing device used by the player.	Compliant	The outcomes of the game are independent of the computer or device used by the player.
5. The game or any game event outcome must not be affected by the effective bandwidth, link utilisation, bit error rate or other characteristic of the communication channel between the gaming system and the playing device used by the player.	Compliant	The outcomes of the game are not affected by the bandwidth, link utilisation, bit error rate, etc.
6. The gaming system must be able to display for each game the following information on the current page or on a page directly accessible from the current page via a hyperlink:-		
(a) the name of the game;	Compliant	The name of the game is displayed on the bet page.
(b) restrictions on play;	Out of scope	Could not be verified because the game has not been integrated with a gaming platform.
(c) instructions on how to play, including a pay-table for all prizes and special features;	Compliant	Instructions on how to play, including a pay table for all prizes and special features are provided.
(d) the player's current account balance;	Compliant	The player's current account balance is displayed.
(e) unit and total bets permitted;	Compliant	The unit bet and total bets are displayed on the bet page.
(f) The rules of the game.	Compliant	The game help file, containing game rules, has been provided.

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Malta Requirements	System Compliance	GA Comments
7. All financial reports produced by the gaming system must be congruent with gaming transaction reports and conversely: Provided that all such reports shall be readily and freely available to the Authority.	Out of scope	Could not be verified because the game has not been integrated with a gaming platform.
8. The gaming system must:-		
(a) be capable of producing monthly auditable and aggregate financial statements of gaming transactions, and	Out of scope	Could not be verified because the game has not been integrated with a gaming platform.
(b) Calculate accurately all taxation and other monies due to the Authority.	Out of scope	Could not be verified because the game has not been integrated with a gaming platform.
9. The gaming system must maintain information about all games played, including:-		
(a) the identity of the player;	Compliant	
(b) the time the game began as recorded on the games server;	Compliant	The game start time is provided.
(c) the balance on the player's account at the start of the game;	Compliant	Player's account balance at the start of the game is provided.
(d) the stakes placed in the game (time stamped by the games server);	Compliant	The stakes placed in the game are provided.
(e) The game status (in progress, complete, etc.);	Compliant	The game status is provided.
(f) the result of the game (time stamped by the games server);	Compliant	The result of the game is provided.
(g) the time the game ended as recorded by the games server;	Compliant	The end time of the game is provided.
(h) the amount won or lost by the player; and	Compliant	Amount won or lost during the game is provided.
(i) The balance on the player's account at the end of the game.	Compliant	Account balance at the end of the game is provided.
10. The gaming system must maintain information about significant events as follows:-	Out of scope	Section 10 could not be verified because the game has not been integrated with a gaming platform.
(a) large wins;		
(b) transfers of funds in excess of such amount as the Authority may from time to time direct by notice in writing to the operator;		
(c) Changes made by the operator to game parameters.		
11. Any variations to any of the requirements specified in this Schedule shall be submitted to the Authority for its approval by notice in writing.	Acknowledged	

4.2 Game Rules

The following game rules have been verified through functional testing:

General information table:

Game Type	Video Slot
Number of Paylines	20 lines
Game Features	• Expanding Walking Wild - When the red Killshot marker appears on top of Bloodshot, he expands over the full reel and he becomes an expanded Wild. He then moves one position to the left, with each spin thereafter, until he exits the screen. • "Free Spins - When 3 or more scatter symbols land on any reels, it awards a choice of 3 different Free Spins missions: Rising Spirit, Desert Storm or Valley of Death. Each Free Spins option awards 12 free rounds initially."

Pay Model 1:

Return to Player	94%
Hit Rate	27.54%

Pay Model 2:

Return to Player	97%
Hit Rate	26.77%

Game Features

Expanding Walking Wild

The red Killshot marker moves across the reels on every spin.

If the red Killshot marker lands on Bloodshot, he expands over the full reel and becomes an expanded Wild.

The expanded Wild Bloodshot reel then moves one position to the left, with each spin thereafter, until it exits the screen.

The feature must be played at the same bet amount that initiated the round. Changing the bet during the feature will cancel the Walking Wild. Returning to the intial bet amount will bring back the Walking Wild.

Free Spins

When 3 or more scatter symbols land on any reels, it awards a choice of one of three different Free Spins games: Rising Spirit, Desert Storm or Valley of Death.

Each Free Spins option awards 12 free rounds initially.

Collecting Wild symbols can award 5 extra Free Spins, once per Free Spins session.

Rising Spirit Free Spins

In Rising Spirit Free Spins there is a multiplier meter and whenever a Wild symbol lands anywhere on the reels, the multiplier increases by 1 and 1 additional Free Spin is awarded.

The multiplier meter starts at x1.

The multiplier meter goes up after the initial win evaluation. The multiplier is applied to the next winning spin.

When the multiplier meter fills up and reaches x16, 5 additional Free Spins are awarded. Any extra wilds that may have landed during that round are not added to the meter.

The extra Wild symbols that land anywhere on the reels after the meter is full, will award 1 additional Free Spin but the multiplier does not increase.

Desert Storm Free Spins

All wins in Desert Storm Free Spins are multiplied by 2.

Wild symbols become Walking Wilds and then moves one position to the left for each spin thereafter until they exit the screen.

During Desert Storm Free Spins, when one or more Wild symbols appear on each of the reels, it awards 5 extra Free Spins.

Valley of Death Free Spins

Wild symbols become Sticky Wild symbols during Valley of Death Free Spins.

Whenever 2 Wild symbols of the same kind land on the same reel, they turn into Double Multiplier Wild symbols.

Whenever 3 Wild symbols of the same kind land on the same reel, they turn into Triple Multiplier Wild symbols.

The transformation of Wild symbols into Double Multiplier or Triple Multiplier Wild symbols takes place before any wins are calculated.

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If a winning line has several multiplier Wild symbols, the multipliers are added together.

During Valley of Death Free Spins, when one or more Sticky Wild symbols appear on every reel, it awards 5 extra Free Spins.

Playing the Game

Betting

To play a round, configure your bet using the + / - buttons on either side of the **Spin** button and/or the **Coin Value + / -** buttons. Then, press the **Spin** button or the **Spacebar** to submit the bet and initiate the round.

Rounds can also be initiated by using the **Autospin** feature.

The **Total bet**, **Balance & Win** amounts can be displayed in coins or cash values. Switching between them can be done by clicking on the bottom UI bar.

Spin Options

Once the round is started, the player can fast-forward to the round result or skip the animations by pressing the **Skip/Stop** button that replaces the **Spin** button while the round is in progress.

To play rounds faster, the player can use the **Quick Spin** or **Turbo Spin** options (restrictions may apply due to regional jurisdictions):

Turbo Spin – the reels spin and stop faster with no extra animations.

Turbo Spin can be activated by:

- Holding the **Spacebar** on a desktop computer.
- Turning it on from the **Autospin** menu, and then initiating **Autospin** rounds.

Quick Spin Mode - the reels spin and stop faster however all extra animations are shown.

Quick Spin can be activated by:

- Turning it on through the **Sandwich** menu
- Turning it on from **Settings**
- Turning it on from the **Autospin** menu, and then initiating the **Autospin** rounds.

Payout Rules

- Winning combinations are paid per line in succession from the leftmost reel to the rightmost reel.
- Winning combinations and payouts are calculated according to the game's "Paytable", which can be accessed through the **Setting** button
- The prizes are calculated using the following formula:
  Bet amount, divided by 20, multiplied by the symbol payout multiplier. Only the scatter wins are multiplied by the total bet.
- Only the highest win per line is paid.
- Malfunction voids all pays.
- Simultaneous wins on different bet lines are added up.
- All wins occur on the selected (active) paylines, excluding scatter wins that pay for any position.

Payout rules in Features

- Free Spins are played at the same bet amount as the round that activated the Free Spins and with the same number of paylines.
- Free Spins wins are added to any initial wins.

- All open sessions, which are not concluded by the player, plus any future transactions for those sessions will be terminated, after a period of time, as defined by the respective regulator per jurisdiction

.COM	30 days
Italy	7 days
Spain	7 days
Denmark	90 days
Sweden	90 days
Romania	30 days
Portugal	90 days

Enables playing the game automatically for a predetermined number of rounds at the current bet configuration.

The Autospin menu is accessible through the Autospin button.

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Autospin Limits

- Loss Limit - Allows you to control your combined losses by entering a numeric value that will stop the Autospin function and trigger a popup message when the loss limit is reached. Calculated as follows:
  (Sum of bets) - (Sum of wins) >= (Loss Limit amount).
- Single Win - Will stop the Autospin function and a popup message will be displayed when a single win payout is >= the 'Single Win' value entered.
- Win Limit - Allows you to control your combined wins by entering a numeric value that will stop the Autospin function and trigger a popup message when the win limit is reached. Calculated as follows:
  (Sum of wins) - (Sum of bets) >= (Win Limit amount).
- On a Win - The Autospin will stop and a popup message will appear on any win within a single round. A free spins feature is considered as one round for this limit setting and the Autospin will only stop after all the free spins are finished.
- On a Feature - The Autospin will stop and a popup message will appear when the game reaches any feature round, including but not limited to: free spins round, bonus games and mini games, with exception to random wilds features.

When the limit's conditions are met, the Autospin will stop and the relevant popup message will appear in the middle of the screen.

PAYTABLE

EXPANDING WALKING WILD

The red Killshot marker moves across the reels with each spin during the base game. If it lands on Bloodshot himself, he expands over the entire reel to become a Walking Wild.

FREE SPINS

When 3 or more scatter symbols land on any reels, it awards a choice of one of three different Free Spins games: Rising Spirit, Desert Storm or Valley of Death. All options award 12 free rounds initially. If 5 scatter symbols land in the same spin, it awards 1000X the total bet.

RISING SPIRIT FREE SPINS

The multiplier meter increases by 1 whenever a Wild lands, plus 1 additional Free Spin is awarded. If the multiplier meter fills up to x16, an additional 5 Free Spins are awarded.

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VALLEY OF DEATH FREE SPINS
X3
WILD
Wild symbols become Sticky Wilds. If 2 or 3 Wild symbols of the same kind land on the same reel, they turn into Double or Triple Multiplier Wild symbols.

DESERT STORM FREE SPINS
WILD
Wild symbols become Walking Wilds after landing and move left with every subsequent spin. All wins are multiplied by 2.

WILD
WILD
WILD
WILD
Substitutes for all paying symbols, except for Scatter symbols.

SYMBOL PAYOUTS
5x = 80
4x = 40
3x = 16
5x = 120
4x = 60
3x = 24
5x = 200
4x = 80
3x = 32
5x = 300
4x = 100
3x = 40

4.3 Return to Player

The test environment has been configured with two pay-model variations for testing purposes. Pariplay advised that in the production environment, Pariplay will offer an operator the choice of the two variations but only one will be enabled for players.

ga has verified return to player (RTP) for two pay-model variations. The theoretical return to player (RTP) for Pariplay's game Bloodshot Rising Spirit is:

- Pay Model 1: 94.00%
- Pay Model 2: 97.00%

A game simulator was run to play the Bloodshot Rising Spirit game and the actual RTP was calculated as follows:

Pay Model	Number of games played (Millions)	RTP%
Pay Model 1	10	93.96%
Pay Model 2	10	96.81%

which is close to the theoretical RTP.

5 References

1. *Remote Gaming Regulations 2004, Legal Notice 176 of 2004 of the Lotteries and other Games Act (ACT XXIV OF 2001), Published on the 20th April 2004, No Revisions.*
2. *RNG Certificate "246RN-400-PAY-19-02-246 - PariPlay CSRNG, Version 1.0.pdf", version 1.0, date15/05/2019.*
3. *Maths spread sheet "Bloodshot945.xlsx", no version, no date.*
4. *Maths spread sheet "Bloodshot970.xlsx", no version, no date.*
5. *Game Description File "Bloodshot Rising Spirit - PRD.pdf", no version, no date.*

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Annex A : SHA-1 Hashes

Game Name	Pay Model	Critical Component	SHA-1 Hashes
Bloodshot Rising Spirit	94.00%	Pariplay.GamesEngine.Slot.VS067.dll	4BDB5107B7B49B1F4C6B2C15D3514BB2CF4743AB
	97.00%	Pariplay.GamesEngine.Slot.VS055.dll	34A221C1713808763176FE3D7559B624928E896D
RNG	Pariplay.GamesEngine.Common.Analyst.dll		8C0C166E37557707DA034348A5CB1CB80FA2B71F
	Pariplay.GamesEngine.Common.Definitions.dll		EE64E660D3EAE3A7B3937C27B3904164FAE49E95
	Pariplay.GamesEngine.Common.Logic.dll		8EB3B3CFE1DFA82E59E0437BAADEC14B14BCEE22
	Pariplay.GamesEngine.Common.RandomGeneratorAlgorithm.dll		AF1591B2756C7145F5D2087C570D3EF3AACDCE53
	Pariplay.GamesEngine.Slot.Definitions.dll		E405F7CB3D7317EF8EF82E7255B2E9FEF2AB1B17
	Pariplay.GamesEngine.Slot.Logic.dll		577FF288A4683885B34B3004B300553CD08CF247

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