

Testing Report.	Pragmatic Play Ltd Game Audit Report – Spaceman (Version: 1.56.24)
Report Identification	PPL-GR-220705-01-GC-R1
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UKAS ISO/IEC 17025 Accreditation No:	9263
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Manufacturer	Pragmatic Play Ltd (Pragmatic Play) Block E, Falcon House, Main Street, Sliema – SLM 1544 Malta
Jurisdiction	Hellenic Gaming Commission - Greece
Technical Standard used for testing	<p>Decision 79841 EX 2020 (B' 3266) Adoption of Regulation on the Technical Specification (TEP) for their Organisation and Operation of Online Games of Chance, published on 05-08-020</p> <p>Decision 79835 EX 2020 (B' 3265) Adoption of Gaming Regulation on the Organisation and Operation of Online Games of Chance, published on 05-08-2020</p> <p>Decision No. 67663 EX 2022 Amendment of the provisions of the decision of the Minister of Finance under 79835 EX 2020 / 24.7.2020</p> <p>Decision No. 56604 EX 2022 Modification of no. 79835EX2020 / 24.7.2020 of the decision of the Minister of Finance "Establishment of Gambling Regulations for the Organization and Conduct of Gambling via the Internet" (B '3265).</p> <p>Decision No. 58876 EX 2022 (1) Amendment of the decision of the Minister of Finance under elements 79841 EX 2020 / 24.7.2020 (B '3266).</p>

# Gaming Associates



## 1 Notations

### 1.1 Confidentiality

This document, all related documents, and methodologies embodied in this document and related documents ("the documents") are the property of Gaming Associates Europe Limited (ga). Unauthorised copying and distribution of the documents, by any means, on any media is prohibited.

This document, its themes, and ideas are strictly confidential and may not be used in any manner other than its expressed purpose, without the written permission of the author. The document is for the Pragmatic Play Ltd and the Hellenic Gaming Commission - Greece.

The documents are copyright.

### 1.2 Disclaimer

ga has reported on what it has discovered through evaluation of Pragmatic Play Ltd's game related to the technical scope of testing as per applicable jurisdictional requirements. Results are based on the Pragmatic Play Ltd's submission of information material, access to the testing environment and applicable testing is performed within a finite period.

Inherently there are limitations in performing compliance testing within a laboratory environment and accordingly ga has undertaken its best endeavours to ensure a thorough assessment is performed and conclusion stated.



## 2 Administration

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### 2.2 Version

Version	Description	Date
V0.1	Initial draft – MARB	2022-06-29
V0.2	Reviewed and Updated – WKAS	2022-06-30
V0.3	QA – UVAS	2022-07-01
V1.0	Final Report to Pragmatic Play	2022-07-05

## 3 Executive Summary

### 3.1 Introduction

Pragmatic Play Ltd (Pragmatic Play) has requested Gaming Associates (**ga**) to test their game Spaceman (Version:1.56.24) against the compliance requirements set by Hellenic Gaming Commission (HGC).

This report presents the results of testing performed by **ga** for the Spaceman (Version: 1.56.24) game. SHA-1 hashes of the game are listed in Annex A: Hashes.

### 3.2 Scope of Testing

The scope of testing included compliance evaluation was performed against following technical standards set by Hellenic Gaming Commission (HGC).

- ♣ 79841 EX 2020 (TEP) Chapter 3 Game Requirements
- ♣ 79841 EX 2020 (TEP) Chapter 6 Requirements for live dealer games
- ♣ 79835 EX 2020 (B´ 3265) Article 12 Other Internet Games
- ♣ 79835 EX 2020 (B´ 3265) Article 16 PARTICIPATION IN GAMES
- ♣ 56604 EX 2022 Article 15 STUDIOS

This compliance evaluation does not include the evaluation of technical standards specific to the Platform, and Random Number Generator (RNG) as these are outside of the scope of this assessment.

### 3.3 Test Summary

1. Game name: Spaceman
2. Channels (game clients):  
HTML5: Supports Desktop and Mobile browsers
3. Game version: 1.56.24
4. Game Category: Category A:1
5. Website URL: <https://emul.pragmaticplay.net/cgAPItest/v3/game/game>
6. PaytableID: 1
7. RNGID: N/A
8. StudioID: N/A
9. RouletteID: N/A
10. Jackpot: No
11. Description of the game:  
Spaceman is an online multiplayer game of "Crash" type. It consists of a multiplier which grows from 1.00x up to a random, predetermined value, when it crashes. Your objective is to cash out before the crash occurs in order to win your bet multiplied by the current multiplier. Please kindly note that spaceman is not a game of skill. Your choice has no impact on the game other than deciding when to cash out. Our cute spaceman character will join you in your quest.
12. Theoretical return to player (RTP) is: 95.50%

### 3.4 Conclusions and Recommendations

Subject to the scope of testing, and on the basis of testing performed by **ga** for Pragmatic Play on the game provided, has formed an opinion that the submitted game comply with the applicable technical standards of the Hellenic Gaming Commission – Greece.



**ga** recommends the Pragmatic Play game - Spaceman to be approved for use in the Pragmatic Play production system.

## 4 Test Results

This section summarises the results of the tests performed on the Pragmatic Play Ltd game Spaceman.

The tables in the following sub-sections provide the compliance status of the game against the applicable requirements of the technical standards of the Hellenic Gaming Commission.

Different values used in the “System Compliance” column are described as follows:

**Compliant:** The game complies with the requirement.

**Non- Compliant:** 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 79841 EX 2020 (TEP) Chapter 3 Game Requirements

HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
Chapter 3	Game Requirements		
Article 17	Introduction		
	This section of the document describes the technical requirements of the rules of the Game and the corresponding Player interfaces.	Acknowledge	
17.2	Player Interface		
17.2.1.	Player Interface		
	This is the interface within the Client Software with which the Player interacts, which is frequently referred to as the ‘gaming window’. The Player interface must meet the following requirements:	Acknowledge	
	A) Any resizing or overlapping of the Player interface must be precisely designed so that the revised screen and touch/click points are correctly displayed after the change.	Compliant	GUI is properly displayed on desktop/mobile.
	b) The functions for all contact/click points shown in the Player interface must be clearly shown in the contact/click point area and/or the rules of the game framework. There must be no hidden or undocumented contact/click points or keyboard commands at any point of the Player interface.	Compliant	There are no hidden buttons or commands for the player interface.
17.2.2.	Game Cycle		
	A Game Cycle consists of all activities and communications during a game. When multiple games are accessible from the game lobby, Players can play more than one Game Cycle at a time in different gaming windows.	Acknowledge	Players can play more than one Game Cycle at a time
	a) Start of a Game Cycle:	Compliant	
	i) where the Player Online Account has adequate funds;		
	ii) where the Player has set the amount of credit used to participate in the Game;		
	iii) where the Player presses ‘play’ (or similar point of entry to a game).		
	b) The following elements of the Game are considered parts of a Game Cycle:	N/A	
	i) games which activate a free game feature and any subsequent free games;		
	ii) a second screen bonus feature;		
	iii) Player selection games (such as Draw Poker or		

HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
	Blackjack);		
	iv) Games whose rules allow additional wagers within a game cycle (such as Blackjack insurance);		
	v) secondary game features (such as double-up/gamble).		
	c) A game cycle is considered to be over when the final transfer on the Player's credit meter is made or when all credits wagered have been lost.	Compliant	
17.3	<b>General Game Requirements</b>		
17.3.1.	<b>Game Information</b>		
	The following requirements apply to game information, the design, paytables and help screens and include all written, graphic, and audio information provided to the Player, either directly by the game interface or by a website accessible to the Player, via a hyperlink located in a prominent position in the game interface.	Acknowledged	
	a) The Game and Player Device instructions must be clearly stated and must not be misleading or unfair to the Player.	Compliant	All the relevant information is provided in the game rules
	b) All statements and graphics in the game information, the design, paytables and help screens are accurate and not misleading.	Compliant	Game rules are accurate and available
	c) All Game rules and payable information must be directly available to the Player, the Player interface or accessible via a hyperlink in the Player interface, without requiring a wager to be deposited.	Compliant	Game rules are available without placing bet
	d) All rules of the game and payable information must be sufficient to explain all applicable rules and how the Player takes part in all stages of the Game.	Compliant	Game rules have sufficient information
	e) Paytable information must include all potential winning outcomes, patterns, rankings, combinations and their respective payments, and a designated denomination/currency. All payments shown are theoretically possible.	Compliant	Payout information is provided in the paytable
	f) There is sufficient information about any prize payment adjustments such as charges, commissions, sliding scale commissions, etc. received by the house.	Compliant	
	g) Where the plan contains instructions about the game which sets maximum winnings, then it must be possible to win that amount from a single game (including game features or other Game options).	N/A	
	h) The Design must have a theoretical Return to Player percentage (%RTP) and fully explain how it is calculated (namely minimum, maximum and average, etc.) and consequently the method for implementing it (namely participation/wagering requirements). For games which offer bonuses and require the existence of a base game bet, the minimum theoretical %RTP for additional bets takes into account the fact that there must be a base game bet.	Compliant	%RTP is mentioned in the game rules.
	i) If the design shows the actual %RTP, the number of games played which are related to the calculation of it must be displayed along with the period during which those games were played.	N/A	
	j) If random/mystery prizes are offered, the maximum value of those prizes must be stated. If the value depends on wagers or any other factors, that must be stated.	N/A	Random/mystery prizes are not offered
	k) Multiple wins. The Design must clearly state the rules for prize payments, where multiple wins are possible.	N/A	
	i) When the pay line has more than one separate winning pattern, it requires a description		

HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
	of the patterns to be paid.		
	ii) In the case where the Game supports multiple pay lines the Design must show a message which declares that any wins on different pay lines are to be added up or equivalent.		
	iii) In the case where the Game supports scatter, the Design must show a message which declares that the scatter game winnings are added to winnings from pay lines or anything similar, if that is a rule of the game.		
	iv) The Design must clearly outline how winning coinciding scatter combinations are handled in relation to other possible scatter wins. For example, the Design must state whether the combinations of scatter symbols pay all potential prizes or only the highest prize.		
	v) The Design must clearly outline how the coinciding results in the Game are handled.		
	l) Extra lines. If wagers on multiple lines are possible and it is not clear which reel positions are part of each of the potential lines, then the extra lines must be clearly shown in the Design and be suitably marked. The extra lines must either be shown in the Design or must be available to view on a help screen or be permanently shown on all game screens, in a location separate from the actual reels.	N/A	Extra paylines are not available.
	m) Multipliers. Where there are multiplier instructions in the Design, it must be clear whether the multiplier applies.	Compliant	Multiplier instructions are available in the game rules.
	n) Symbols/Objects. All game symbols must be clearly shown to the Player and must not be misleading in any way. The Game symbols must keep the schema throughout the Design, apart from the case where an image is in motion.	Compliant	Symbols are clearly displayed in the online game rules.
	o) Substitutes/Wilds The Design must clearly state which symbols can operate as substitutes/wilds and which winning combinations can be applied.	N/A	This is not a slot game
	p) Scatter-type Games The Design must clearly state which symbols can operate as scatter symbols and which winning combinations can be applied.	N/A	The game is not a slot game.
	q) Upcoming Wins. The game must not show upcoming wins unless the display is accurate and mathematically proven or if the Player has viewed his/her current progress (for example he/she has collected two of the four tokens).	N/A	
	r) Card games. The requirements for Games featuring cards drawn from a deck are as follows:	N/A	The game is not a card game.
	i) Games that use multiple decks of cards must clearly indicate the number of card decks in play.		
	ii) From the moment cards are removed from the deck, they must not be returned to it, unless specified in the rules of the Game.		
	iii) The deck must not be shuffled again unless provided for by the rules of the Game.		
	s) Multi-wager games. The following requirements apply to multi-wager games:	N/A	The game is not the multi-wager game.
	i) Every wager must be clearly formulated so that the Player has no doubt about the Wagers he/she is making and the credits per Wager.		



HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
	ii) Every win must be displayed to the Player in a way that clearly correlates the win to the corresponding Wager. Where there are wins associated with multiple wagers, each winning Wager must be shown in order.		
	t) Game information, the design, paytables and help screens must not show inappropriate or insulting information in any manner or form.	Compliant	No inappropriate or insulting information is displayed
<b>17.3.2.</b>	<b>Information shown</b>		
	The following Game Information must be separate or easily accessible to the Player at any time during a Play Session:	Acknowledge	
	a) The name of the Game being played;	Compliant	The game name is visible
	b) Restrictions on the Player or on Wagers, such as any limits on the duration of play, maximum winnings, etc.;	Compliant	Sufficient information is provided in the Game Rules
	c) The balance of the Player Online Account for the current Play Session;	Compliant	Balance is visible on the bet screen
	d) The current wager. This refers only to the phase of the Game where the Player can add funds to the current Wager or place new Wagers in that phase.	N/A	
	e) The current placement of all Wagers (such as roulette numbers, Blackjack insurance, etc.).	Compliant	The current placement of the bet is displayed to the player
	f) The denomination of the bet.	N/A	
	g) The amount won in the last completed game (until the next game starts or changes the wager options).	Compliant	Winning is displayed until the next game starts
	h) The Player's operations (such as the wager, the lines played) in the last completed game (until the next game begins or changes the wager options).	Compliant	Player completed game status is provided.
	i) The initial Player options must be described (such as the choice of a runner in a horse race must state the name, number and expected payout). The Player's options, once the game has begun, must be clearly displayed on the screen (cards held, hit, split, keno numbers, etc.).	Compliant	All choices made by the player are displayed
	j) The winning amount for each wager and the total amount won must be displayed on the screen.	Compliant	Winnings are displayed clearly.
<b>17.3.3.</b>	<b>Forced Game Play</b>		
	a) The Player must not be forced to play a Game simply because he/she selects it.	Compliant	The player is not forced to play the game
	b) It must not be possible for the Player to start a new game in the same Game window before all relevant meters on the CIS and all relevant connections and the balance in the Player Online Account have been updated.	Compliant	
	c) If an auto play mode is integrated, it must be possible to deactivate that mode at any time during the game.	Compliant	Autoplay can be stopped at any time
<b>17.3.4.</b>	<b>Game fairness</b>		
	Games must not provide false expectations of better odds by presenting circumstances or events in an erroneous manner.	Acknowledged	The game outcomes are fair and do not provide false expectation.
	a) In Games designed to give the Player the feeling that he/she controls the Game outcome through his/her Player skill, although in reality that is not the case (which is to say the game outcome is random) the help screens must indicate that the Game outcome depends on luck.	Compliant	The game does not give the player a false perception of having control over the games
	b) The end result of each Game must be displayed for quite some time to allow a Player to learn about the outcome of the Game.	Compliant	Result of the game are displayed for a reasonable length of time
<b>17.3.5.</b>	<b>Return to Player</b>		
	The minimum Player return percentages are laid down in the relevant provisions. Moreover, the requirements determining how those percentages	Compliant	The game rules with game instructions and RTP% are available.

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	are calculated must be laid down. The testing laboratory must conduct an independent evaluation of these requirements and policies.		
<b>17.3.6.</b>	<b>Odds</b>		
	The Authority may lay down the policy on winning odds. The testing laboratory must conduct an independent evaluation of these policies.	Compliant	The instructions on game play including all payouts are provided
<b>17.3.7.</b>	<b>Game Outcome</b>		
	All critical functions, including generation of the outcome of each Game (and the return to the Player) must be generated by the Gaming Platform and must be independent of the Player Device.	Acknowledged	The generation of game results is independent of the end player device
	a) The Game Outcome must not be affected by the bandwidth, link utilisation, bit error rate or other feature of the communication channel between the Gaming Platform and the Player Device.	Compliant	Player bandwidth or device does not affect game outcome.
	b) The determination of the events of chance resulting in a sum of money must not be affected or controlled by anything other than arithmetic values arising in the appropriate manner from the RNG, if used, and in accordance with the rules of the Game.	Compliant	
	c) Any possible change and/or combination of Game elements which generates win/lose outcomes, must be available for random selection at the start of each game, unless otherwise stated by the Game.	Compliant	Sufficient information is provided.
	d) The results specified in accordance with the resulting combinations based on the rules of the Game must be applied immediately.	Compliant	Results are displayed timely
	e) In the case where the sequence or mapping of symbols or outcomes (such as the location of hidden objects in a maze) needs to be defined in advance, the symbols or outcomes must not be able to be adjusted, apart from those cases specified for such in the rules of the Game.	Compliant	Outcomes are not adjustable
	f) The Game must show the results in a clear and accurate manner, without substituting the way the result is presented, with alternative means of presentation which show an unsuccessful outcome as 'near win'.	Compliant	Results are clearly displayed
	g) Unless otherwise specified by the rules of the Game, events of chance in Games must be independent of and unrelated to other events within the Game, or with events in past Games.	Compliant	
	h) For some types of Games, such as spinning reel games, unless the Player is informed otherwise, the mathematical probability of a symbol appearing in a position for any Game outcome must be fixed.	Compliant	
<b>17.3.8.</b>	<b>Simulation of physical devices</b>	<b>Out of scope</b>	
	When a Game depicts or insinuates that it includes a simulation of a real device (such as the spinning of wheels, the rolling of dice, the tossing of coins, the sharing out of cards, etc.), the simulator's behaviour must follow the expected behaviour of the real device, unless otherwise stated in the rules of the Game. In other words:		
	a) For Games that simulate reality, the visual representation of the simulation must correspond to the features of the real device.		
	b) In the simulation, the probability of any event affecting the outcome of the Game must be equivalent to the corresponding probability for the actual device. For example, the odds of one achieving a certain number in Roulette where there is one single zero (0) and one double zero (00) on the wheel, must be 1 in 38. The probability of selecting a specific card or cards in poker must be		

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	the same as the probabilities in a live game.		
	c) Where the Game simulates multiple real devices which are normally independent of each other, each simulation must be independent of the other simulations.		
	d) In the case where the Game simulates actual devices that have no memory of previous events, the behaviour of the simulations must be independent of the previous behaviour, so that they are non-adaptable and unpredictable in practice.		
<b>17.3.9.</b>	<b>Games with time dependencies</b>		
	a) For Games where the outcome is affected by the response time to a game event, the Gaming Platform must offer the Game after informing the Player of any disadvantages associated with the communication channel. Games which are by their nature unfair will not be approved.	Compliant	
	b) Rules must clearly describe the procedure to follow if the Player disconnects from the server during a Game of this sort (such as internet connection failure, PC crash, etc.).	Compliant	Disconnection Policy is clearly mentioned in the game rules
<b>17.4.1.</b>	<b>Game/Bonus Features</b>	<b>N/A</b>	<b>The Game is not a slot game.</b>
	This section refers to Games where one or more of the bonus features/prizes are paid to the Player. In general terms, bonus prizes must be awarded as a result of some second (or subsequent) moving image screen and, unless otherwise provided to the Player, must be part of the theoretical %RTP for the overall payable. For those games which rely on bonuses, the Design must cover the following topics:		
	a) The Game must clearly show the Player which rules of the Game apply to the game's current status. Those rules must be made available to the Player prior to the start of the bonus Game and not during it.		
	b) The Game must clearly show the Player the range of the probable win amount, the multiplier range, etc. which could be won in the bonus Game.		
	c) For bonuses which do not appear randomly during a Game, adequate information must be shown to the Player which indicates the current status which will lead to activation of the next bonus.		
	d) If the Game requires the acquisition of various events/symbols to activate a bonus, the number of events/symbols collected must be stated.		
	e) Where applicable, the Game must show the rules for cases where the correct number of events/symbols needed to activate a bonus are not acquired.		
	f) If the acquisition of tokens can lead to free games, the number of possible lines and credits per line to be bet during the free games must be shown.		
	g) If the bonus sequence consists of more than one feature game, the number of games left for the bonus sequence must be displayed.		
	h) The Game must not adjust the probability of a bonus, based on the historicity of prizes received in previous games, unless this option of the game has been notified to the Player prior to his/her participation (for example games do not adapt their theoretical return to the Player based on previous payouts).		
	i) If bonuses are activated in a Game after collecting a specific number of events/symbols, or a combination of events/symbols of different types in multiple Games, the probability of acquiring new		

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	events/symbols which are the same must not worsen as the game goes on, unless if this option in the game has been clearly notified to the Player prior to his/her participation in the game (for example, for similar events/symbols the last events/symbols required must not be more difficult to obtain than previous events/symbols of that sort).		
	j) If a Game allows the Player to hold one or more reels/cards/symbols for one or more re- spins/draws, the held and non-held reels/cards/symbols must be clearly displayed on the screen and the method for changing holds must be clearly shown to the Player.		
	k) If a bonus feature is provided in which the Player must bet additional credits, the Player must be given a choice of whether or not to enter the bonus game. A Player who opts not to enter the bonus game must be directed to the main game in the mode it was in prior to the bonus. A Player who opts to enter the bonus game but does not have enough credit to continue:		
	i) must use the temporary winnings from the main game or previous stages of the bonus game, where that is permitted by the rules of the Game;		
	ii) authorise the transfer of amounts to his/her Online Account;		
	iii) perform a combination of (i) and (ii) above, if permitted by the rules of the Game.		
<b>17.4.2.</b>	<b>Gamble Feature</b>	<b>N/A</b>	<b>Gamble Feature is not available</b>
	The following requirements apply to games which offer the choice to increase the winning result (a gamble feature) (these games can also use terms such as Double-Up, Triple-Up or Take-or-Risk). The Player must have the option to participate or not. Unless otherwise indicated to the Player, the gamble feature must have a theoretical RTP of 100% and must not affect the theoretical RTP of the overall payable. For such games, the Design must cover:		
	a) The prize limit (if applicable) and the maximum number of wagers available.		
	b) When the gamble feature is interrupted before reaching the maximum number of available wagers, the reason must be clearly stated.		
	c) Any unusual game conditions must be stated during which the gamble feature is not available.		
	d) If the gamble feature offers a multiplier option, the range of options and payouts must be clarified for the Player.		
	e) The moment the Player chooses a multiplier, the multiplier chosen must be clearly stated on- screen.		
<b>17.5</b>	<b>P2P Requirements</b>		
<b>17.5.1.</b>	<b>Peer to Peer (P2P)</b>	<b>N/A</b>	<b>Game is not a Peer-to-Peer game</b>
	P2P game rooms are rooms which offer Players the chance to play Games and participate together or against others. In such rooms the Licence Holder (Operator) usually does not have an active role in the Game (such as house-banked gaming) but provides the Games or room for use by Players and takes a rake, fee or percentage for providing the service. Systems that offer P2P Games must also do the following unless otherwise stated in the rules of the Game:		
	a) They must provide a mechanism that detects and prevents Players' collusion, artificial Player software, unfair advantages to Players, and the ability for one person to influence the outcome of a Game or Tournament.		

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	b) They must provide warnings about how bots can affect a game so that Players can take an informed decision on whether to participate. In addition, they must provide instructions about abnormal bot usage in the Game. All the above must be clearly mentioned in the terms and conditions of the Game.		
	c) They must dissuade authorised Players from occupying more than one position at each individual table.		
	d) They must provide authorised Players the option to participate in a table where all authorised Players have been randomly selected.		
	e) They must inform authorised Players about the time each Player sits at a particular table.		
	f) They must not use artificial Player software that acts as an authorised Player except in the case of free play or in training modes.		
17.5.2.	<b>Computerised Players</b>	N/A	
	The following requirements apply to the use of computerised Players used in free play or in training modes.		
	a) The software may make use of Artificial Intelligence (AI) in the Game for demonstrations, free play or training modes.		
	b) The use of AI software must be clearly explained in the help menus.		
	c) All computerised Players must be clearly indicated so that actual Players know which Players are computerised.		
17.5.3.	<b>Contests/Tournaments</b>	N/A	<b>Contests/Tournaments are not provided for this game</b>
	In organised events which allow a Player to either purchase or secure partnership in a competitive Game against other Players, the following rules must apply:		
	a) Participation in a game tournament must not involve actual money, but special tournament points or chips must be used, which have no real cash value.		
	b) The rules of the game contests/tournaments must be available to authorised Players through the Licence Holder's website. The rules shall include at least:		
	i) All conditions which registered Players must meet as a requirement for entering and taking part in a contest/tournament.		
	ii) The conditions relating to delayed arrivals or no-shows in the tournament, and the conditions on how auto-blind postings and/or initial entry purchases are dealt with.		
	iii) Specific information on any single contest/tournament, including the amount of monies available in the prize pool.		
	iv) The allocation of amounts based on specific results.		
	v) The name of the organisation (or individuals) running the contest/tournament on its behalf or in cooperation with the Licence Holder (Operator) as appropriate.		
	c) The results of every contest/tournament must be available on the website in order to be re-examined by participants. At the same time as posting on the website, the results of each contest/tournament must also be available upon request. The record of the results must include:		
	i) the name of the event,		

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	ii) the date(s) of the event,		
	iii) the total number of entries,		
	iv) the entry fees,		
	v) the total prize pool,		
	vi) an amount paid for each winning category.		
	Note: In the case of free contests/tournaments (i.e. where the authorised Player does not pay an entry fee) all information needed about the above must be recorded apart from the number of participants, the entry fee and the total prize pool.		
<b>17.6</b>	<b>Game Recall</b>		
<b>17.6.1.</b>	<b>Player facing History</b>		
	The option to replay the last game should be offered, either by reproduction or by description. The replay must clearly state that it is a replay of the entire previous game cycle and must provide the following information (as a minimum):	Acknowledge	
	a) the game date and start/end time;	Compliant	Date and time are available in the history
	b) information associated with the final outcome of the Game, reproduced for the Player either via graphics or via a text message;	Compliant	A graphical representation of the final outcome is available
	c) all cash amounts/credits of Players at the start and end of the Game;	Compliant	The cash/Credit amount is displayed in the history
	d) total amount wagered;	Compliant	The total amount Wagered is displayed in the history
	e) total cash amounts/credits won for the prize (including any progressive jackpots);	Compliant	The total win amount is displayed in the history
	f) the results of Player choices involved in the outcome of the Game;	Compliant	
	g) the results of any intermediate stages of the Game (such as gambles or feature games);	N/A	
	h) amounts obtained from promotions.	Out of scope	Operator's responsibility.
<b>17.6.2.</b>	<b>Back-end History</b>	<b>Out of scope</b>	<b>Operator's responsibility.</b>
	For each individual game, in addition to the above information that is needed, the CIS must also record the following information:		
	a) the unique Player ID;		
	b) any contributions to Progressive Jackpot draws;		
	c) the game's status (under way, over, etc.);		
	d) the table number played in the Game (if any);		
	e) the payable used;		
	f) the game ID and version.		

## 4.2 79841 EX 2020 (TEP) Chapter 9 – Random Number Generators

HGC Req #	HGC Requirements	Compliance Status	Comments/Anomalies
<b>Article 25</b>	<b>Random Number Generator characteristics</b>	<b>Compliant</b>	<b>Refer to the certificate "484RN-400-PPL-21-01-484 - Random Number Generator - Greek.pdf"</b>
<b>25.1.</b>	<b>General requirements for the Random Number Generators</b>		
	The random number generator (RNG) must have strong encryption at the time of submission. When more than one instance of a random number generator is used in the CIS, each instance must be assessed and certified separately. When the instances are identical, but require different implementation in the Game/application, each implementation must be assessed and certified		

HGC Req #	HGC Requirements	Compliance Status	Comments/Anomalies
	separately. Analysis of the data and of the source code identification must demonstrate that any results of the random number generator used in determining the symbol/outcome of the Game:		
	(a) are statistically independent		
	(b) are fairly distributed (within statistically expected limits) across their range		
	(c) have passed various recognised statistical tests		
	(d) are strongly encrypted.		
<b>25.2</b>	<b>Applied Tests</b>		
	<p>The independent certification laboratory may use various applied tests to determine whether the random values generated by the random number generator successfully pass the desired 99% confidence level or not. Those tests may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>(a) chi-square test</li> <li>(b) equi-distribution (frequency) test</li> <li>(c) gap test</li> <li>(d) overlaps test</li> <li>(e) poker test</li> <li>(f) coupon collector test</li> <li>(g) permutation test</li> <li>(h) Kolmogorov-Smirnov test</li> <li>(i) agency criterion test</li> <li>(j) statistical order test</li> <li>(k) run tests (the pattern of occurrences should not be repeated)</li> <li>(l) interplay correlation test</li> <li>(m) serial correlation test potency and degree of serial correlation (outcomes must be independent of the previous Game)</li> <li>(n) sequence tests</li> <li>(o) Poisson distribution.</li> </ul> <p>NOTE: The independent certification laboratory must select the appropriate tests on a case-by-case basis, depending on the RNG being examined.</p>	Acknowledged	
<b>25.3</b>	<b>Scaling</b>		
	The scaling method must not jeopardise the random number generator's encryption strength. Furthermore, the scaling method must safeguard the distribution of the scaled values. For example, if a 32-bit random number generator with a range of all the whole numbers within the closed interval [0, 232-1] needs to be adjusted to the range of all the whole numbers within the closed interval [1,6], so that the scaled values can be used to simulate rolling a six-sided die, then each whole number in the scale's range must have the same theoretical frequency of occurrence..		
	In the example given, if the theoretical frequency for each value is not equal, then the scaling method is considered to have a bias. Consequently, a compliant scaling method should have a bias equal to zero.		
<b>25.4</b>	<b>Hardware- based Random Number Generator</b>		
	Because of their nature, the performance of random number generators that use hardware may deteriorate over time. The failure of a hardware based RNG could have serious consequences for		



HGC Req #	HGC Requirements	Compliance Status	Comments/Anomalies
	the Game/application, e.g. Games could become predictable or have non-equitable distributions. Therefore, if a hardware-based RNG is used, there must be a dynamic/active, real-time tracking of the output, with a sample size large enough to allow several statistically robust tests, so that the Game is deactivated when an error is detected in the test result output.		
25.5	<b>Software – based Random Number Generator</b>		
	The following requirements apply only to random number generators using software.		
25.5.1	<b>Period</b>		
	The period of the RNG, in conjunction with the methods of implementing the RNG results, must be long enough to ensure that all independent combinations/variants of the result of the Games are possible for given Games/applications.		
25.5.2	<b>Seeding/re-seeding</b>		
	The Seeding/Re-seeding methods must ensure that all the values of the seed used to start or initialise the random number generator are determined in such a way as not to jeopardise the cryptographic security of the random number generator.		

#### 4.3 79835 EX 2020 (B' 3265) Article 12 OTHER INTERNET GAMES

HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
Article 12	<b>OTHER INTERNET GAMES</b>		
12.1.	<b>The Games that are allowed to be played under the Type 2 License are as follows:</b>		
	a. Casino games, poker variants thereof, played live, and/or in a studio, with a live dealer and whose outcome is not generated by a Random Number Generator;	N/A	
	b. Casino games, poker and / or variations thereof, the result of which is extracted from a Random Number Generator. The maximum amount of Participation in the other online games when they are carried out using the random number generator (RNG) is twenty (20) euros. "	N/A	
	c. Poker and/or variants thereof played peer to peer or poker cash games or poker tournaments.	N/A	
12.2.	It is not permitted to conduct the games stated in subparagraphs (a) and (c) of this Article on tables and at events by which Licence Holders provide gambling services from licence holders from countries considered to be non-cooperative jurisdictions for tax purposes within the meaning of Article 65(3) of Law 4172/2013 (Government Gazette 167/A) and the countries referred to in paragraph 3 of Annex II of Law 4557/2018 (Government Gazette 139/A).	N/A	
12.3.	The maximum payout in Games referred to in paragraph 12.1(a) shall be set by the Licence Holder per Game or group of Games and is a multiple of the minimum wager for the Game.	N/A	
12.4.	The maximum payout for Games referred to in paragraph 12.1(b) may not exceed one hundred and forty thousand euro (€140,000) per Game Cycle, including the value of all additional Game prizes which are allowed to be provided and excluding any jackpots, under the provisions of said Regulations.	N/A	



HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
12.5.	The maximum payout for Games referred to in paragraph 12.1(c) shall be set by the Licence Holder per Game or group of Games, or event and in compliance with the terms and conditions of participation.	N/A	

#### 4.4 79835 EX 2020 (B' 3265) Article 16 PARTICIPATION IN GAMES

HGC Req #	Hellenic Gaming Commission Requirements	System Compliance	Comments/Anomalies
<b>Article 16</b>	<b>Participation in Games</b>		
16.1.	Participation in Games should be the result of one's free and independent personal choice and should also be done without incitement or exhortation (unstimulated gambling). The Licence Holder shall offer the Players information concerning the rules governing the playing of games, the win odds for each of them as well as information on where they can turn to in case of addiction. The respective information must be provided by the Licence Holder on the Licence Holder's website, as well as any other appropriate means.	Compliant	
16.2.	The Licence Holder shall provide the Player with information about:		
	a. Their participation in Games in such a way that they may make decisions being fully aware of the rules concerning how to play the Games they opt to participate in;	Compliant	
	b. The potential dangers from exposure to gambling, such as loss of money and addiction. In that context, when running Games of Chance whose outcome is determined by an RNG, the main screen must show Responsible Gambling messages in such a way and for such time that they are perceived as interfering with the playing of the Game and can be adequately taken in by the Player;	Out of scope	
	c. The existing bodies offering help and support to addicted Players and their families.	Out of scope	
16.3.	Participation in games through intermediaries is not allowed	Out of scope	
16.4.	The start of a new Game Round is not possible before two (2) seconds have elapsed from the start of the previous Round.	Compliant	

#### 4.5 Return to Player

The theoretical return to player (RTP) for Pragmatic Play Ltd game - Spaceman (Version: 1.56.24) (PaytableID: 1) is: 95.50%.

A game simulator was run to play 5 billion games of the Spaceman game and the actual RTP was calculated as 95.50% which is close to the theoretical RTP.



## 5 References

1. *Decision 79841 EX 2020 (B' 3266) Adoption of Regulation on the Technical Specification (TEP) for their organization and operation of online games of chance, published on 05-08-2020.*
2. *Decision 79300 EX 2020 (B' 3261) Adoption of regulation on change management in Central Management in Central Information Systems (CIS), published on 05-08-2020.*
3. *Decision 79835 EX 2020 (B' 3265) Adoption of Gaming Regulation on the Organisation and Operation of Online Games of Chance, published on 05-08-2020.*
4. *Decision No. 67663 EX 2022 Amendment of the provisions of the decision of the Minister of Finance under 79835 EX 2020 / 24.7.2020*
5. *Decision No. 56604 EX 2022 Modification of no. 79835EX2020 / 24.7.2020 of the decision of the Minister of Finance "Establishment of Gambling Regulations for the Organization and Conduct of Gambling via the Internet" (B '3265).*
6. *Decision No. 58876 EX 2022 (1) Amendment of the decision of the Minister of Finance under elements 79841 EX 2020 / 24.7.2020 (B '3266).*
7. *484RN-400-PPL-21-01-484 - Random Number Generator - Greek.pdf*
8. *Maths's spreadsheet "Spaceman\_math.xls", no version, no date.*
9. *Game Description "Spaceman Game Design", no version, no date.*

**Annex A : Hashes of Critical Components**

The following hashes of critical components for the product tested are recorded.

File name	SHA-1
SpaceManRNGObject.class	3c63dcf9cb899413de1bef1ddadb7e4ef1082945
SpacemanRngConfiguration	9d7824655484f82086f0fd885d7a4de7b494328c
SpacemanFirstLevelRngConfiguration	81929791ff5e804c1f9540a514030fca67eabf45
ResultCodeVO.class	f7ff44c528a4c6f22a90e936cc299c497045d6b3
BetCodeVO.class	1e0c535c5357f06538b84b936aa34670d86bb931



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