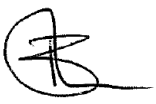
TEST REPORT SUMMARY

Issued by:	BMM Testlabs South Africa (Pty) Ltd. No. 10 Brands Hatch Close Kyalami Business Park Kyalami Midrand, 1685
Project Number:	GGNET.1004
Report Number:	GGNET.1004.01
Issue Date:	December 19, 2017
Applicant:	NSUS Limited Suite 15, the Cubes Office, Beacon South Quarter, Sandyford Business Park, Dublin 18 D18 X283, Ireland
Standards Tested To:	United Kingdom Remote Gambling and software technical standards, June 2017.
Product Type:	Random Number Generator (RNG)
Product Name:	Online Poker Game
Manufacturer:	NSUS Limited
Conclusion:	Pass

Signed



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Penelope Ngcoya
Director Of Operations

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BMM, has conducted a level of testing which has historically been adequate for a submission of this type. However, inherent in testing in a laboratory environment is the unavoidable limitations of it not being possible to verify the effects of all possible configurations and environments that occur in actual gaming venues.

1. Purpose

NSUS Ltd requested BMM Testlabs South Africa (Pty) Ltd., hereinafter referred to as BMM, to evaluate the random number generator (RNG) for operation in the United Kingdom Remote Gambling Market.

2. Description of RNG

The RNG used is the RNGCryptoServiceProvider built into the .NET framework. It is an interface for the Windows CryptGenRandom function, which provides cryptographically secure random numbers. Although the exact implementation details are unknown, it is known to combine a secure hashing algorithm with various hardware and software sources of entropy.

3. BMM Evaluation Performed

BMM examined the RNG source code and performed statistical tests on the output from the RNG.

3.1 Source Code Review

The CryptRandGenerator class provides a wrapper for an RNGCryptoServiceProvider instance. A static instance of the CryptoRandGenerator class is used by all gaming sessions on the server. The underlying RNG is provided by the Windows CryptAPI and requires no seeding as it draws from the operating system's entropy pool.

The RNG provides a method for drawing scaled numbers in a target range of up to 255, or 8 bits in size. The scaling algorithm does not introduce any bias. A Task is created upon initialisation that runs continuously in the background to ensure the RNG is cycled at least once per every 100 milliseconds. This ensures the RNG's state remains unpredictable.

Due to the cryptographic security of the RNG, the underlying RNG's state cannot be saved or restored at any point. This is desirable, as the RNG's state must remain unknown and unpredictable at all times to maintain its security.

3.2 Statistical Testing

Statistical tests were performed on the output from the RNG. Sets of numbers of varying sizes from 500 to 20,000,000 in the ranges of 32, 52 and 111 were generated three times each and tested.

The following tests were performed on the data set:

- Frequency – frequency of each number across the entire sample set.
- Pairs Correlation – frequency of each combination of two numbers occurring together.
- Gap – counts of the size of gaps between successive occurrences of numbers across the entire sample set.
- Coupon Collector – counts of how long it takes to collect complete sets of numbers.
- Runs – counts of ascending and descending sequences of numbers.
- Serial Correlation – counts of occurrences of pairs of numbers with specific gaps between them.
- Kolmogorov-Smirnov – test of the linear distribution of the chi-square probability results.
- Diehard tests – a suite of stringent tests on raw output from the RNG.

4. Test Results

The statistical tests on output from the RNG passes at the 99% confidence level. The following chart shows the distribution of test result probabilities and confirms their overall linearity.

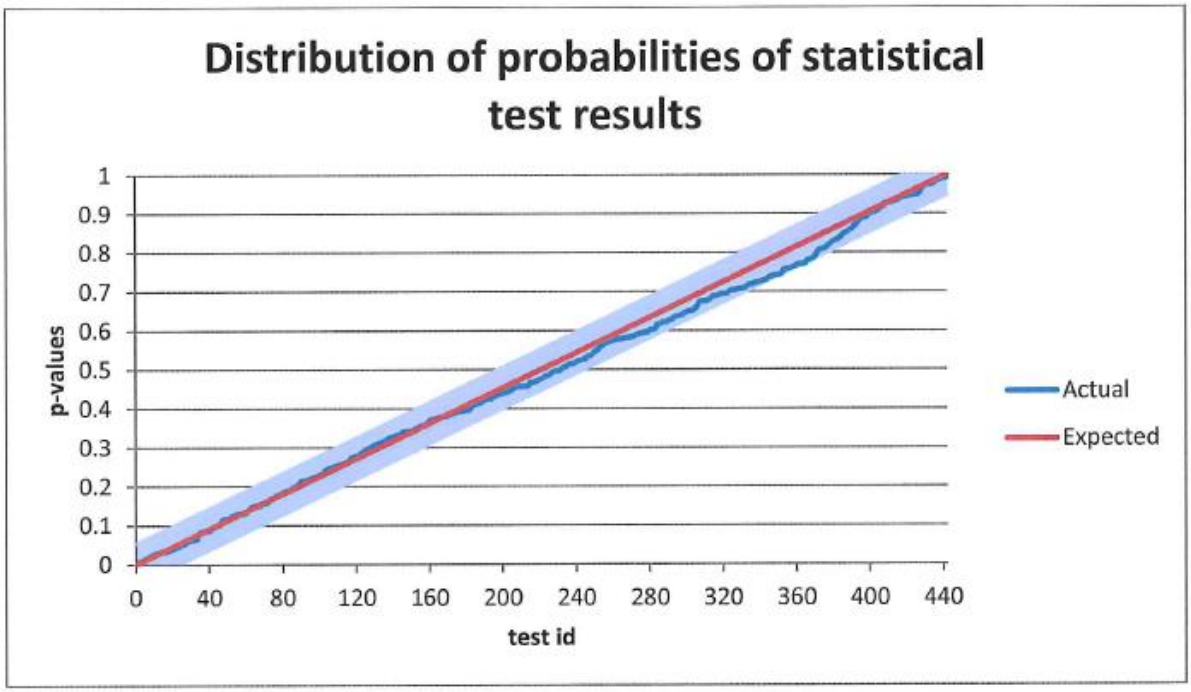

Figure 1: Distribution of probabilities of test results on output from the RNG

5. Conclusion

As a result of statistical testing and source code review, BMM believes that the RNG used by the Online Poker Game provides uniformly random data suitable for its intended application. This RNG complies with the applicable requirements of United Kingdom Remote Gambling and software technical standards, June 2017.

Director of Operations Penelope Ngcoya **Signed:**

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