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Amigotechs Online Gaming Solutions Warning

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To whom it may concern:

On January 5, 2012, Certified Fair Gambling (www.certifiedfairgambling.com) (CFG) was contacted by management at Youwager (www.youwager.eu) to investigate a complaint that a player had about 50-play Jacks or Better video poker (JOB50) offered at their casino. Youwager informed me that they use the online casino software package created and licensed by Amigotechs (www.amigotechs.com).

The player at Youwager claimed that while playing JOB50, in those situations where he held draw hands (a flush draw, a straight draw, high cards, low pair, 5 new cards), he did not make a hand of Jacks or Better on any of his 50 completed hands. He also claimed that in those situations when he held a made hand and drew cards (a high pair, two pair or trips), he did not improve that hand on any of his 50 hands.

Youwager was cooperative in providing all necessary log files, providing two test accounts, giving information about system implementation, and answering all other questions. Upon request, I was provided with log files giving play for certain players on JOB50 for the period August 4, 2011 through December 27, 2011. These log files detailed the date and time the game was played, the initial cards dealt to the player, the cards the player held, and the replacement cards for each of the hands. In total, 922 hands of JOB50 were provided in these log files.

Unfortunately, the log files for each hand were cut short and did not contain all 50 completions. Typically, they contained from 37 to 39 completions. I investigated the reason the log files were truncated, but was unable to arrive at a wholly satisfactory conclusion.

Based on my examination of the log files, I determined that the complaint had merit and that the software operated in a manner that was unfair to the player. My conclusions follow.

- During the period December 16, 2011 to December 27, 2011, if the player had a drawing hand then he did not improve to Jacks or better in any of the hands given in the log file. Thus the player's claim that draw hands did not improve was found to be true.
- During the period December 16, 2011 to December 27, 2011, the player's claim that made hands did not improve was found to be false.
- Based on a random sampling of hands, the software operated correctly during the period August 4, 2011 to December 15, 2011.

To be more specific, a total of 25 hands of JOB50 were present in the log files for the period December 16, 2011 to December 27, 2011. Of those 25 hands, 6 were made hands and 19 were draw hands. The 19 draw hands never improved to a pair of Jacks or better. Of the 6 made hands, 3 were a high pair and 3 were two-pair. In the case of the high pair, each improved at least once when the replacement cards were dealt. In the case of the two-pair hands, one of them improved and two did not.

The drawing hands, the cards the player held, and the number of valid log file entries are given in the following table:

Cards Dealt	Cards Held	Hands available in log file
AS,3D,KD,4C,TD	AS,KD	37
6S,QH,7H,9H,4H	QH,7H,9H,4H	39
8C,3D,AS,6D,QD	AS,QD	37
3H,8D,4H,9H,2D	None	39
KS,6D,2D,9C,JS	KS,JS	39
3C,4C,9H,8C,4S	4C,4S	39
3H,QD,TC,6H,KC	QD,KC	38
8S,9C,QC,2C,6D	QC	39
3S,3C,2D,6C,4H	3S,3C	39
2D,TH,2H,JD,6C	2D,2H	37
7S,2D,5S,QD,8H	QD	37
9C,3H,TH,4D,JD	JD	37
3S,6H,JH,5H,QD	JH,QD	37
6D,AH,JD,KH,4C	AH,KH	39
3S,JD,9H,AH,5D	AH,JD	38
5D,7H,8H,3C,QS	QS	39
2D,4C,8H,JH,3S	JH	38
8C,9C,2S,6C,6H	6C,6H	39
KD,7H,TC,9C,6D	7H,TC,9C,6D	39

To obtain the chance that this happened at random, detailed computations were performed for each hand. These computations determined the exact probability that the player did not improve each specific hand. Taking into account the truncated log files, the probability that none of these 19 draw hands improved to a hand that is Jacks or better is:

P = 1.244426E-121 =

There are 120 zeroes to the right of the decimal in this number.

To put this in perspective, it is more likely to win the United States Powerball lottery 14 times in a row, buying a single ticket, than that the results of this game happened purely by chance. It is more likely,

playing blackjack, to be dealt a blackjack 90 times in a row than that the results of the game happened purely by chance.

If all 50 hands are taken into consideration, this number becomes

P = 2.303642E-159 =

[Note. On 01/09/2012, I was supplied with complete log files for JOB50 for the period February 11, 2011 to January 7, 2012. During the period between December 15, 2011 and December 28, 2011, no draw hand improved to Jacks or Better. In total, there were over 120 draw hands that did not improve during this period. Before December 15, 2011 and after December 28, 2011, the game of JOB50 performed in a statistically normal fashion and there were no instances of this issue. The mathematical analysis of the additional hands occurring between December 15, 2011 and December 28, 2011 is not included in the computation of the probability given above.]

My opinion is that this software was programmed to allow it to make the player lose. In this past, software providers have argued that such behavior was the fault of a bad random number generator or simply bad luck by the player. In my opinion, the game was programmed by someone who had access to the source code and acted in a malicious manner devised to make the player lose. The easiest way to write a program in this way is to have it randomly deal cards to complete the hand, and if the hand becomes a winner, simply repeat the deal until the completed hand is less than a pair of Jacks. Then go on to the next hand. This type of behavior is easy to spot on a multi-hand game because of the unusual final result. This behavior would become much more problematic to spot on a game with fewer lines or a single line. I did not examine the log files for other variations of video poker. However, it would be unreasonable to expect such a limitation on the scope of this particular issue.

Based on my investigation, I determined that Youwager did not have access to the source code and could not have made any changes to the Amigotechs software operating on their website. Youwager appears to have no culpability in this matter and in every way cooperated. For this reason I conclude that Youwager had neither fault nor intent in this matter.

I conclude that Amigotechs, the vendor who supplied the casino software to Youwager, is responsible for providing a product that was programmed to act in a malicious fashion to the detriment of the player and that this software did act in a malicious fashion on 19 occasions.

[I would like to acknowledge and thank Michael Shackleford for his independent analysis confirming the bias and for his review and helpful comments in the preparation of this letter.]

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