

**The Need for Minimum Technical Standards for
Class II Gaming Systems in the Context of Cyber
Vulnerabilities – A Modern Day Imperative**

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The Need for Minimum Technical Standards for Class II Gaming Systems in the Context of Cyber Vulnerabilities – A Modern Day Imperative

Executive Summary

In 2008, the National Indian Gaming Commission (NIGC) promulgated Minimum Technical Standards for Class II Indian gaming (“Minimum Technical Standards” or “Standards”). These Standards were passed in an effort to “address and mitigate activity that jeopardizes the integrity of Indian gaming” and “swiftly act on anything that jeopardizes the health and safety of the public.”¹

In response to concerns regarding these Standards, the NIGC commissioned a study (the “Meister Report”) which concluded that the Standards would cause hardship by reducing gaming and non-gaming revenues, resulting in the closure of certain gaming facilities and decreasing the number of tribal member jobs.² Relying on the Meister Report, the NIGC deployed a “Grandfather period,” which delayed the date by which older Class II games were required to comply with the Minimum Technical Standards — first until 2013, and subsequently until 2018.

History indicates that there was no basis for concerns that these contemporary standards would negatively impact tribes. The experience of the last decade, during which implementation of these new standards was required for all newly-built Class II games, has shown that the Meister report was erroneous. Compliant Class II games are thriving. Data characterizing the past decade indicate that meeting new requirements has been both feasible and necessary given the rapidly spreading specter of cyber-criminality threatening both the integrity of Indian gaming and public safety.

This report concludes that the NIGC’s proposed rule to permanently exempt older machines from the vast majority of the Minimum Technical Standards will generate a host of negative outcomes for tribal stakeholders. While the benefits sought by grandfathering proved illusory, the risks are expanding. Security concerns intensify as grandfathered machines fall further behind the technical curve. Risks of a major security breach asymptote to virtual certainty, with many hidden costs accompanying these risks.

¹ National Indian Gaming Commission, *Our Mission*. <https://www.nigc.gov/commission/principles-and-priorities>. Accessed October 16, 2017.

² Meister, Alan. 2008. *The Potential Economic Impact of the October 2007 Proposed Class II Gaming Regulations*. Commissioned by the National Indian Gaming Commission. February 1, 2008. Page 3.

Introduction

The National Indian Gaming Commission (NIGC) implemented a five-year grandfather period, followed by a second five-year period, during which existing Class II gaming systems were exempted from the Minimum Technical Standards found in 25 C.F.R. 547.³ The purpose of the grandfather periods was to negate any negative economic consequences of mandating immediate compliance and to allow Indian gaming facilities time to bring their machines into compliance. This second five-year grandfather period is set to expire on November 10th, 2018.

This report: 1) analyzes the predictions that served to justify the two prior grandfather periods, concluding that the predictions were faulty and have proven incorrect; 2) discusses the growing threats of non-compliance; and 3) examines the current state of Class II gaming and the broader economy.

I. Incorrect Rationale for Exemptions

A 2008 report titled “The Potential Economic Impact of the October 2007 Proposed Class II Gaming Regulations” (The Meister report)⁴ set forth a number of arguments against implementing Minimum Technical Standards on Class II gaming machines.

The Meister report argued that because compliant Class II machines would be slower, more cumbersome to play, confusing, and less diverse, they “would be less appealing to patrons and generate less gaming revenue than existing Class II machines.”⁵ This argument was predicated on the assumption that the compliant Class II Electronic Gaming Machines (EGMs) would require a player to press a button at least two times in order to buy a bingo card, mark their bingo card, and claim their prize.⁶ As a result, individual games would take longer and patrons would play fewer games per hour at a compliant Class II EGM. While at the time compliance standards that required at least two button presses to win were, indeed, under consideration,⁷ they were never implemented.

The incorrect assumption that Class II EGMs would be slower is critical to Meister’s analysis. The Meister report presented three different scenarios to estimate lost gaming revenue as a result of

³ 25 CFR Part 547 - MINIMUM TECHNICAL STANDARDS FOR CLASS II GAMING SYSTEMS AND EQUIPMENT

⁴ Meister, Alan. 2008. *The Potential Economic Impact of the October 2007 Proposed Class II Gaming Regulations*. Commissioned by the National Indian Gaming Commission. February 1, 2008.

⁵ The Meister Report, page 14

⁶ *Id.*

⁷ The Meister Report, pages 9-14.

fewer machines and diminished revenue per machine due to compliance,⁸ ranging from more than \$1.2 billion to \$3.7 billion.⁹

Existing data regarding the growth of activity in compliant Class II gaming, both in terms of quantity of machines and associated revenue, indicate that these machines have been at least as attractive to players as non-compliant machines. If Meister’s predictions were accurate, new compliant machines would have under-performed compared to legacy equipment, which would have induced slower machine replacement rates as casinos strove to hang on to their older, non-compliant machines for as long as possible. This effect would have been even more pronounced in facilities operating only Class II machines, which could not add growth through Class III machines to compensate for the predicted problems with new Class II games. Instead, the available data shows the opposite.

Exhibit 1: Gaming machines growth ranked by state, 2008-2015

Rank	State	2008-2015 CAGR	Rank	State	2008-2015 CAGR
1	Alabama	11.9%	15	New Mexico	1.0%
2	Texas	10.2%	16	California	0.6%
3	Nebraska	6.9%	17	Colorado	0.6%
4	Montana	4.3%	18	Oregon	0.5%
5	North Carolina	4.0%	19	Minnesota	-0.2%
6	Oklahoma	3.8%	20	New York	-0.3%
7	Florida	3.2%	21	Louisiana	-0.7%
8	South Dakota	2.9%	22	Wisconsin	-0.8%
8	Wyoming	2.9%	23	Iowa	-0.9%
10	Washington	2.0%	24	Idaho	-1.0%
11	Arizona	1.9%	25	Nevada	-1.3%
12	Michigan	1.8%	26	Kansas	-1.7%
13	North Dakota	1.6%	27	Mississippi	-3.3%
14	Alaska	1.5%	28	Connecticut	-5.2%

Source: Casino City’s Indian Gaming Industry Report, 2017 Edition

Exhibit 1 above is particularly revealing. It shows that instead of the slowest growth rates, three of the four states that exclusively utilized Class II machines (Alabama, Texas, and Nebraska) experienced the *fastest* growth in machine population between 2008 and 2015. The stock of machines in Alabama and Texas increased by more than 10 percent per annum over this period.

Even narrowing the analysis to include only states with Indian gaming facilities, those states that could only grow with compliant Class II games still outperformed their counterparts. From 2014 to

⁸ The Meister Report, page 45.

⁹ In 2013 dollars to reflect the loss at the end of the first grandfather period.

2015, Indian gaming facilities in Texas experienced faster gaming revenue growth (15.5 percent) than any of the other twenty-seven states. Alabama ranked second with 11.1 percent year-over-year revenue expansion. This is overwhelming evidence proving the popularity of compliant Class II machines. They are much more than simply viable or acceptable, they are thriving in the marketplace. Exhibit 2 supplies relevant statistical detail.

Exhibit 2: Gaming revenue growth ranked by state, 2014-2015

Rank	State	2015 Growth %	Rank	State	2015 Growth %
1	Texas	15.5%	15	Wisconsin	3.5%
2	Alabama	11.1%	16	Minnesota	3.5%
3	North Carolina	10.9%	17	Oregon	3.0%
4	South Dakota	10.8%	18	New Mexico	2.8%
5	Florida	9.3%	19	Kansas	2.5%
6	California	8.0%	20	Colorado	2.4%
7	Idaho	7.4%	21	Michigan	1.7%
8	Oklahoma	6.7%	22	North Dakota	1.4%
9	Montana	6.3%	23	Iowa	0.9%
10	Mississippi	5.0%	24	Louisiana	0.3%
11	Arizona	5.0%	25	New York	-0.4%
12	Washington	4.6%	26	Connecticut	-1.2%
13	Nebraska	4.5%	27	Nevada	-4.3%
14	Alaska	4.2%	28	Wyoming	-14.4%

Source: Casino City's Indian Gaming Industry Report, 2017 Edition

Narrowing the analysis further to the tribes that only operate only Class II games yields similar repudiations of Meister's predictions. Alabama, Alaska, Nebraska, and Texas operate only Class II machines within their gaming facilities.¹⁰ 2007 was the final full year during which non-compliant machines could be procured. That year, only 11 new machines were placed in those four states representing growth of approximately 0.3 percent. If Meister's report were correct, one would expect to see that meager growth rate spike in early 2008 as casinos bought up as many non-compliant machines as they could before regulations went into effect. After that year, machine placement would presumably dwindle.

In fact, growth did surge in 2008, by 22.1 percent. However, instead of falling off as anticipated, growth continued thereafter driven purely by compliant Class II machines. The year 2009 was associated with 11.9 percent growth, which was followed by 2010's 9.8 percent performance. In

¹⁰ Meister, Alan. 2017. *Casino City's Indian Gaming Industry Report, 2017 Edition*. Page 33.

2012, growth totaled 16.9 percent. Growth has continued since, often by double-digits on a per annum basis. (Exhibit 3)

Perhaps the most telling example is Alabama, where Meister’s dire predictions pointed to diminished revenue, shuttered facilities, and foregone tribal employment. Rather than experiencing a collapsing marketplace, Alabama witnessed its Class II machines increase by 142 percent from 2,600 in 2008 to 6,300 just five years later. As indicated above, Alabama had the second highest revenue growth of all states in 2015.

Based on these data and insights, the introduction of compliant Class II machines has had no discernible negative impact on the marketplace. The market for Class II gaming continued to be vigorous in areas adding compliant machines even during a period punctuated by the Great Recession. Facilities in these four states (Texas, Alabama, Nebraska, Alaska - Exhibit 3) added nearly 5,900 compliant machines between 2008 and 2015. Compliant machines collectively represent a majority of machines now in operation in these four states.

Exhibit 3: Class II Machines in states operating only Class II machines, 2006-2015

	2006	2007	2008 ¹¹	2009	2010	2011	2012	2013	2014	2015	CAGR ¹²
Alabama	2,101	2,052	2,600	3,000	3,270	4,200	4,769	6,300	6,337	6,400	11.8%
Alaska	30	40	80	80	80	90	90	80	90	90	11.6%
Nebraska	314	318	389	449	478	483	490	651	666	662	7.7%
Texas	1,325	1,371	1,548	1,638	1,844	1,858	1,988	2,786	2,796	3,357	9.7%
Total	3,770	3,781	4,617	5,167	5,672	6,631	7,337	9,817	9,889	10,509	10.8%

Source: Casino City’s Indian Gaming Industry Report, 2017 Edition

One could argue that Class II machine growth in these four states is attributable to a lack of competition from Class III machines, which aren’t permitted there. However, even the Meister Report agrees that competition for gaming dollars has been on the rise even where Class III facilities are prohibited because of the emergence of alternative forms of gambling.

For example, the Meister Report explains in detail the rising competition encountered by Alabama’s Indian gaming facilities. In 2003, greyhound racetracks began operating electronic bingo machines that are faster than those operated at Indian gaming facilities. Three years later, Alabama began operating “sweepstakes machines,” which emulate the look and feel of slot machines.¹³ Despite

¹¹ This is the year in which the technical standards were implemented. Despite the grandfather period, all subsequently manufactured Class II machines had to comply with the standards after this point.

¹² For ten-year period from 2006 to 2015.

¹³ The Meister Report, pages 26-27

increasingly intense competition, Alabama's Class II EGMs have become increasingly popular and accessible to consumers.

Another argument against the faithful implementation of Minimum Technical Standards was that Indian gaming facilities would incur large, upfront capital costs. The Meister report predicted capital, deployment, and compliance costs in the range of \$267.2 million to \$654.3 million.¹⁴ Even though such costs would apply to manufacturers, not Indian gaming facilities, Meister's report asserted that "these are good estimates of the increased costs to tribes assuming that such costs are passed through to tribes."¹⁵ That assertion is both highly speculative and misplaced. All Class II EGM manufacturers that have placed new games since 2008 have now been building compliant systems for years. Moreover, the Indian gaming market relies heavily, often exclusively, on leased machines as opposed to purchased machines. Because vendors are willing to supply compliant Class II EGMs that perform at least as well as their non-compliant predecessors, there are facially no economic burdens to tribes that are required to replace non-compliant machines as leases expire.

The Meister Report also estimates lost non-gaming revenue as a result of the October 2007 proposed regulations.¹⁶ The notion was that fewer players on compliant machines would translate into diminished visitation and less consumer spending on non-gaming activities and items. His analysis is a simple one and applies the ratio of Class II machine-related non-gaming revenue to Class II machine revenue. The resulting estimated lost non-gaming revenue ranges from \$25.6 million to \$79.4 million.¹⁷ But this estimate of lost non-gaming revenue is based upon yet another layer of speculation that all his earlier suppositions were true. Available evidence suggests that these earlier presumptions and predictions were invalid. Correspondingly, Meister's estimates of lost non-gaming revenue have proven inaccurate.

The Meister Report states that "previous research has shown that there is a strong correlation between gaming revenue and number of gaming-related employees." Based on his assumption that compliant Class II games must be slower, less profitable, and less patronized, he claims that tribal member jobs would be lost as a result.¹⁸ However, since gaming revenues have tended to rise with the growing prevalence of compliant Class II EGMs, it seems clear that the introduction of compliant EGMs has not reduced employment opportunities for tribal members.

¹⁴ The Meister Report, page 56.

¹⁵ *Id.* at 57

¹⁶ *Id.* at 51

¹⁷ *Id.* at 52

¹⁸ *Id.* at 59

II. Growing Security Threats

Not only are the economic factors pointing towards requiring compliance, there are rapidly expanding security concerns related to increasingly vulnerable non-compliant EGMs. Specifically, the existence of non-compliant Class II machines renders Indian gaming facilities susceptible to large-scale losses that could outweigh any remaining costs associated with bringing pre-2008 Class II machines into compliance.

This notion that a casino could fall victim to digital fraud is hardly conjecture. In 2014, a group of Russian scammers exploited a defect in slot machines and were able to steal more than \$10,000 a day from a single casino.¹⁹ There exists a Russian business with a singular focus upon the use of algorithms to reverse engineer the timing of EGMs. This business sends operatives to targeted casinos around the world to exploit vulnerabilities.²⁰ Most of these exploits are targeted at older machines, for example Aristocrat's Mark VI model machine,²¹ specifically because they lack the protections of modern machines.

According to a report by Darktrace, a cybersecurity firm that monitors digital vulnerabilities, hackers have also breached a North American Casino's internal data through an internet-connected fish tank, stealing more than 10 GB of potentially sensitive data in the process.²² Continuing to allow Indian-operated gaming facilities to be vulnerable to such attacks is at odds with sensible public policy.

One need not look exclusively to the gaming industry for evidence of vulnerability. Equifax, a consumer credit reporting agency with technical resources far in excess of any individual gaming facility, recently fell victim to a hack that exposed the sensitive personal information of more than 143 million Americans.²³ Equifax's market capitalization plunged from \$17 billion to \$11.2 billion during the week that followed. Within two weeks of the Equifax hack becoming public, the U.S. Securities and Exchange Commission announced that one of its filing systems had been breached.²⁴

Based on available evidence and recent history, we conclude that a single technical breach could cost a gaming facility millions of dollars. This represents the most important reason to disallow

¹⁹ Koerner, Brendan. *Wired*. *Russians Engineer a Brilliant Slot Machine Cheat—and Casinos have no Fix*. February 6, 2017.

²⁰ Koerner, Brandon. *Wired*. *Meet Alex, the Russian Casino Hacker Who Makes Millions Targeting Slot Machines*. August 5, 2017.

²¹ Koerner, Brendan. *Wired*. *Russians Engineer a Brilliant Slot Machine Cheat—and Casinos have no Fix*. February 6, 2017.

²² Schiffer, Alex. *The Washington Post*. *How a fish tank helped hack a casino*. July 21, 2017.

²³ Gressin, Seena. *The Federal Trade Commission*. *The Equifax Data Breach: What to do*. September 8, 2017.

²⁴ Lynch, Sarah. *Reuters*. *Hack of Wall Street Regulator Rattles Investors, Lawmakers*. September 21, 2017.

permanent grandfathering of non-compliant machines. The older, non-compliant Class II machines represent massive sources of potential loss and liability to Indian gaming facilities. Non-compliant machines rely upon software and operating systems that are at least nine years old, that have been publicly accessible for several years, and that do not meet contemporary Minimum Technical Standards.

III. Propitious Timing

Economic uncertainty in the wake of the Great Recession represented a primary motivator for the second grandfather period that began in 2013. Gaming revenues had stagnated over the prior five years (see Exhibit 4) and there was a natural reluctance to layer additional costs on Indian gaming facilities.

Exhibit 4: Indian Gaming Revenues, 2000-2015

	Actual \$ (millions)	Nominal Growth	2015 \$ (millions)	Real Growth
2000	\$10,958.7	11.8%	\$15,083.6	8.2%
2001	\$13,137.8	19.9%	\$17,582.6	16.6%
2002	\$15,122.7	15.1%	\$19,924.0	13.3%
2003	\$17,366.5	14.8%	\$22,370.4	12.3%
2004	\$20,039.2	15.4%	\$25,143.6	12.4%
2005	\$22,888.2	14.2%	\$27,771.1	10.4%
2006	\$25,219.0	10.2%	\$29,649.5	6.8%
2007	\$26,352.6	4.5%	\$30,124.3	1.6%
2008	\$26,782.2	1.6%	\$29,483.7	-2.1%
2009	\$26,485.6	-1.1%	\$29,260.9	-0.8%
2010	\$26,741.9	1.0%	\$29,067.2	-0.7%
2011	\$27,618.4	3.3%	\$29,101.3	0.1%
2012	\$28,153.8	1.9%	\$29,064.0	-0.1%
2013	\$28,315.2	0.6%	\$28,808.6	-0.9%
2014	\$28,906.9	2.1%	\$28,941.2	0.5%
2015	\$30,491.7	5.5%	\$30,491.7	5.4%

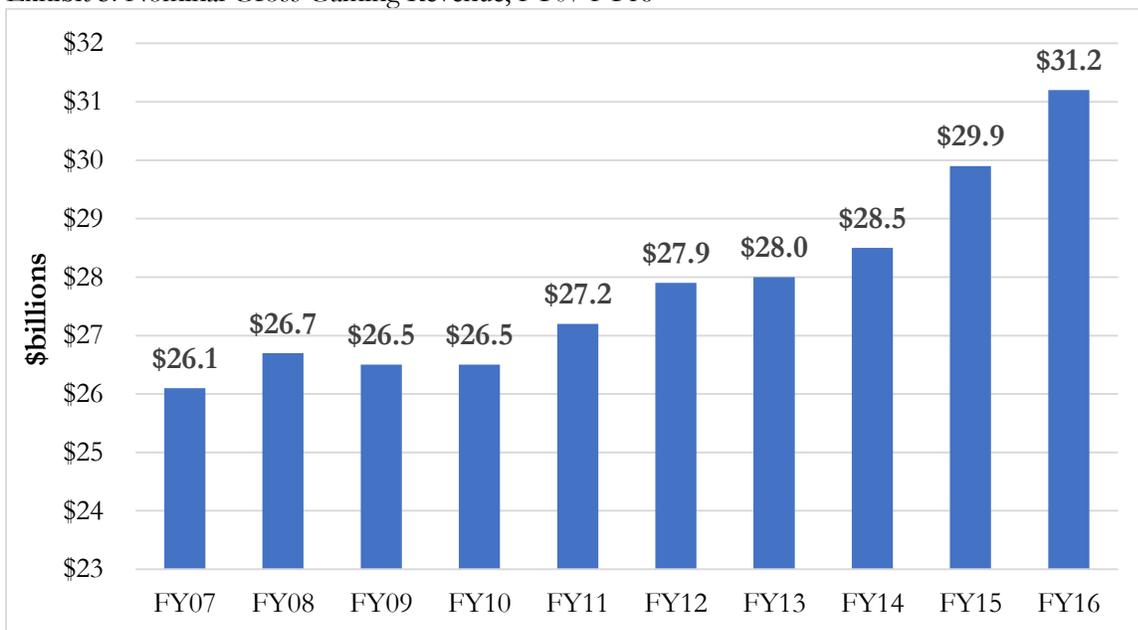
Source: Casino City's Indian Gaming Industry Report, 2017 Edition

As of this writing, the U.S. is in its ninth year of economic recovery. This is now the third lengthiest expansion cycle in American history. Gross domestic product has increased in twenty-four of the previous twenty-five quarters. As of this writing, unemployment is at roughly a 17-year low and

national employment has increased for eighty-five consecutive months, the longest streak on record.²⁵

A recent Federal Reserve report indicates that net household wealth has never been higher in America.²⁶ Wealth gains are attributable to both a surging stock market and ongoing gains in housing values. Consumer spending growth continues to push the broader U.S. economy forward, helping to explain the economic outperformance of areas such as Las Vegas and Orlando. The nation also boasts a record number of job openings (6.2 million), rising median household incomes, and declining poverty rates.²⁷

Exhibit 5: Nominal Gross Gaming Revenue, FY07-FY16



Source: NIGC

Predictably, broader economic strength has translated into improving gaming revenues. According to the NIGC, gross gaming revenues surpassed \$30 billion for the first time in FY2016, jumping to \$31.2 billion. Revenues expanded 9.5 percent from FY2014 to FY2016 after expanding just 4.9 percent during the prior six-year period. Despite the Great Recession, revenues doubled during the 2000-2015 period.

²⁵ U.S. Department of Labor, Bureau of Labor Statistics. *The Employment Situation—August 2017*. September 1, 2017.

²⁶ Board of Governors of the Federal Reserve System. *Report on the Economic Well-Being of U.S. Households in 2016*. May 2017.

²⁷ U.S. Department of Commerce, Bureau of Economic Analysis. *Gross Domestic Product: Second Quarter 2017 (Second Estimate)*. August 30, 2017.

A September 2017 press release from the Federal Reserve’s Open Market Committee predicts that over the next few years “economic activity will expand at a moderate pace, and labor market conditions will strengthen somewhat further.”²⁸ As indicated by Exhibit 5, nominal gross gaming revenue has been racing higher since FY2014. In short, this represents a propitious moment to invest in the future of Indian gaming by replacing vulnerable, non-compliant machines with modern, safer ones.

Conclusion

This report concludes that:

1. The introduction of compliant Class II machines has not negatively impacted Indian gaming facility revenues. In fact, revenue growth has been far sharper in contexts in which these machines have been introduced.
2. Non-compliant machines still in operation at Indian gaming facilities represent a source of enormous digital vulnerability and fraud.
3. The current period represents an advantageous economic environment in which to replace non-compliant machines with compliant ones.

As indicated in this report, many of the capital costs associated with transitioning from non-compliant to compliant Class II machines have already been incurred over the decade-long grandfathering period. It makes sense to complete the transition, reducing cyber-vulnerability and associated financial risks facing Indian gaming facilities in the process. A permanent grandfathering of non-compliant Class II EGMs is therefore not justified on the basis of sound public policy.

²⁸ Board of Governors of the Federal Reserve System. *Federal Reserve issues FOMC statement*. September 20, 2017.

Sage Policy Group, Inc.

Sage Policy Group, Inc., a Sub Chapter S Corporation, was established in 2004 by Anirban Basu. Sage is an eleven-person economic and policy consulting firm specializing in economic, fiscal and legislative analysis, program evaluation, and organizational and strategic development. The firm's clients include public agencies at every level of government, law firms, developers, money managers, and an array of nonprofit organizations operating in a variety of segments. As experts in research methods, our corporate focus is to utilize sound, widely accepted analytical techniques that provide our clients and their stakeholders with valid and reliable knowledge and information to support critical organization and decision-making requirements.

Over the course of its 13-year history, Sage has conducted many studies related to gaming. Gaming-related clients include The Maryland Jockey Club, the Horseshoe Casino in Baltimore, casino developers in Delaware, the Maryland Horse Breeders Association, and the developers of a new \$1.2 billion casino at National Harbor in the Washington metropolitan area.