

Gaming machine testing strategy

For categories A, B1, B2, B3, B3A, B4, C, D, server networked and downloadable, cashless payment, linked progressives and wireless networks

Revision 1 - January 2014

1 Introduction

- 1.1 Sections 96 and 97 of the Gambling Act 2005 (the Act) enable the Gambling Commission (the Commission) to set technical standards for gaming machines and gambling software respectively, to make arrangements for the administration of tests of compliance with standards and to provide for the enforcement of standards and submission to tests by attaching conditions to operating licences. Condition 2 of the Commission's *Licence Conditions and Codes of Practice (LCCP June 2007)* requires gambling software and gaming machine technical licensees to comply with the Commission's technical standards and with requirements set by the Commission relating to the timing and procedures for testing.
- 1.2 This document sets out the testing requirements for each set of standards. This includes who can test against the standards, what will need to be tested and the deadlines for testing. It discusses the testing strategy for assessing compliance with the machine standards for categories A, B1, B2, B3, B3A, B4, C, D, server networked and downloadable games, cashless payment machine systems, linked progressives and wireless networks published on 1 June 2007. It also covers system integration testing and commercial site testing. Its publication follows discussions with industry representative bodies, operators and test houses on the Commission's proposed approach.
- 1.3 The Commission is aware that testing cannot be completed prior to release for new gaming machines coming on to the market in the first few months without causing substantial delays. This has been taken into account in this strategy.
- 1.4 The Commission has published separately the implementation annexes for each category of gaming machine, setting out the timetable for compliance. This document should be read alongside the corresponding implementation annexes.

2 Machine standards categories A, B1 and B2

- 2.1 Category A, B1 and B2 game titles manufactured from 1 September 2007 will be required to be tested against all sections of the applicable standard, and relevant regulatory requirements in force at the time of testing, by a Commission approved third party test house.
- 2.2 Such tests may have been carried out retrospectively for game titles manufactured prior to 1 September 2008 (after the machine has been supplied into the market) provided that the required testing had been completed by 31 August 2008. Manufacturers should ensure that machines supplied into the market prior to testing comply with the standards as far as possible, although the Commission recognises that there may be elements of some machines that are not fully compliant until the machine has been retrospectively modified.

- 2.3** Manufacturers may opt to have their game titles tested against the regulations that were in force at 1 September 2008 if they choose to do so. Where any regulation has not come into force at the time the machine is tested the Commission would not require it be retrospectively re-tested, subject to section 13 (Change controls), unless any non-compliance issue(s) are identified (where the modification is required to comply with regulations).
- 2.4** Game titles manufactured from 1 September 2008 will be required to be tested by a Commission approved third party test house prior to being commercially exploited subject to section 12 (Site testing for commercial purposes).
- 2.5** The Commission does not intend to test retrospectively any category A, B1 and B2 game titles manufactured, or machines converted, before 1 September 2007, including those subsequently modified to comply with the applicable technical standard and/or regulations unless any non-compliance issue(s) are identified, in which case the Commission, on a risk assessment basis, may require that the machine be tested by a Commission approved third party test house.

3 Machine standards category B3

- 3.1** Category B3 game titles manufactured from 1 September 2007 will be required to be tested against the sections of the applicable standard and relevant regulatory requirements in force at the time of testing by a Commission approved third party test house. Retrospective tests are acceptable for machines manufactured prior to 1 September 2008 (after the game titles had been supplied into the market) provided that all reasonable steps had been taken to ensure that the game title complied with the applicable standard and relevant regulations and the required testing had been completed by 31 August 2008.
- 3.2** Manufacturers may opt to have their game titles tested against the standards and regulations that were in force at 1 September 2008 if they choose to do so. Where any sections of the standards or regulations have not come into force at the time the game title is tested the Commission would not require it be retrospectively re-tested, subject to section 13 (Change controls), unless any non-compliance issue(s) are identified (where the modification is required to comply with regulations). Game titles that comply with the Commission's standards in force at the time of manufacture (for those manufactured between 1 September 2007 and 31 August 2008) do not have to be modified to comply with those standards that came into force on 1 September 2008.
- 3.3** Game titles manufactured from 1 September 2008 will be required to be tested by a Commission approved third party test house prior to being commercially exploited subject to section 12 (site testing for commercial purposes).
- 3.4** The Commission does not intend to test retrospectively any Category B3 game titles manufactured or machines converted before 1 September 2007, that comply with the new or legacy standards. This includes game titles or machines subsequently modified to comply with the applicable technical standard and regulations that come into force later (between 1 September 2007 and 31 August 2008) unless any non-compliance issue(s) are identified, in which case the Commission, on a risk assessment basis, may require that the machine be tested by a Commission approved third party test house.
- 3.5** 'Legacy machines' may continue to be operated indefinitely provided that where adapted to comply with any regulatory or other legislative requirements they continue to comply with the Commission's legacy standard. The Commission does not intend to test retrospectively such machines. Where a legacy machine is modified after 1 September 2007 such that it no longer complies with the legacy standards it will be treated as being manufactured after 31 August 2007 and will be subject to the applicable technical and test requirements.

4 Machine standards category B3A

- 4.1** Category B3A game titles manufactured and supplied from the incept date of the B3A technical standard will be required to be tested against all sections of that standard and relevant regulatory requirements in force at the time of testing by a Commission approved third party test house. Such tests may be carried out retrospectively for game titles manufactured up to one year after the game title has been supplied into the market provided that the required testing has been completed within 12 months following the incept date of the technical standard.
- 4.2** Game titles manufactured 12 months after the incept of the technical standard will be required to be third party tested by a Commission approved third party test house prior to being commercial exploited, subject to section 12 (site testing for commercial purposes).
- 4.3** Manufacturers may opt to have their game titles tested against the regulations that will be in force at 1 September 2008 if they choose to do so. Where any regulation has not come into force at the time the game title is tested the Commission would not require it be retrospectively re-tested, subject to section 13 (change controls), unless any non-compliance issue(s) are identified (where the modification is required to comply with regulations).
- 4.4** The Commission does not intend to test retrospectively category B3A game titles manufactured and supplied before the incept date of the B3A technical standard, including those subsequently modified to comply with the applicable standard and/or regulations unless any non-compliance issue(s) are identified whereby the Commission, on a risk assessment basis, may request that the game title be tested by a Commission approved third party test house.

5 Machine standards category B4

- 5.1** To be treated the same as category C and D gaming machines.

6 Machine standards category C and D

- 6.1** Category C and D game titles manufactured from 1 September 2007 can be tested against the sections of the applicable standard and relevant regulatory requirements in force at the time of testing by a Commission approved third party test house (in the same fashion as for category A and B game titles) or by the manufacturer where they are able to provide assurance of independence between the testing function and commercial operation and comply with sections 9.5 – 9.7 (testing conducted by licensee/operator). Such tests may be carried out retrospectively for machines manufactured prior to 1 September 2008 (after the game titles have been supplied into the market) provided that all reasonable steps have been taken to ensure that the game title complies with the applicable standard and relevant regulations and that the required testing has been completed by 31 August 2008.
- 6.2** Manufacturers may opt to have their game titles tested against the standards and regulations that will be in force at 1 September 2008 if they choose to do so. Where any section of the standards or regulations have not come into force at the time the game title is tested the Commission would not require it be retrospectively re-tested, subject to section 13 (change controls), unless any non-compliance issue(s) are identified (where the modification is required to comply with regulations). Game titles that comply with the Commission's standards in force at the time of manufacture (for those manufactured between 1 September 2007 and 31 August 2008) do not have to be modified to comply with those standards that come into force on 1 September 2008.

- 6.3** Where the manufacturer opts to test and approve game titles in-house they will be required to have one game title (of a machine type) tested by a Commission approved third party test house within a 12 to 24 months period at the Commission's discretion. The Commission will decide on the frequency of test for each operator based on our compliance risk assessment programme. The term 'machine type' refers to the machine's architecture and configuration and where significantly different to other products manufactured it would be considered a machine type in its own right. Where any non-compliance issues arise the Commission may require that further game titles be tested by a Commission approved third party test house on a risk assessment basis.
- 6.4** In instances where a game title had already been tested by a Commission approved third party test house the Commission would not require that it be re-tested unless any non-compliance issues are identified.
- 6.5** The Commission does not intend to test retrospectively any category C and D game titles manufactured or machines converted before 1 September 2007 that comply with the new or legacy standards. This includes game titles or machines subsequently modified to comply with the applicable technical standard and regulations that come into force later (between 1 September 2007 and 31 August 2008) unless any non-compliance issue(s) are identified, in which case the Commission, on a risk assessment basis, may request that the machine be tested by a Commission approved third party test house.
- 6.6** 'Legacy machines' may continue to be operated indefinitely provided that where adapted to comply with any regulatory or other legislative requirements they continue to comply with the Commission's legacy standard. The Commission does not intend to test retrospectively such machines. Where a legacy machine is modified after 1 September 2007 such that it no longer complies with the legacy standards it will be treated as being manufactured after 31 August 2007 and will be subject to the applicable technical and test requirements.

7 Machine standards

Server networked and downloadable, cashless payment machine systems, linked progressives and wireless networks

- 7.1** Equipment of the above categories manufactured from 1 September 2007 will be required to be tested against the sections of the applicable standard by a Commission approved third party test house. Such tests may be carried out retrospectively for equipment manufactured prior to 1 September 2008 (after the equipment has been supplied into the market) provided that all reasonable steps have been taken to ensure that the game title complies with the applicable standard and relevant regulations and that the required testing has been completed by 31 August 2008. Provided that the system (which has been tested) is not modified then it will not be a requirement for such tests to be repeated when used for different applications.

8 System integration testing and associated fairness testing

- 8.1** System integration describes the situation where primary elements of a gaming machine such as the cabinet, random number generator, operating system or game content are used in different combinations, by manufacturers, suppliers or operators. Examples of this arrangement are video terminals (category B2 gaming machines) such as those operated in licensed betting premises (formerly referred to as fixed odds betting terminals) whereby multiple game content supplied by various vendors is offered.
- 8.2** The Commission intends to take a flexible approach to integration testing and therefore the following approaches are permitted.

Internal testing

8.3 Internal testing is where the platform provider supplies sufficient software interface details to the game vendor with respect to system integration, and the software vendor ensures compliance of their game software via the Commission's testing requirements as normal.

8.4 In all circumstances where the software vendor and hardware/terminal provider are different parties, the following should be documented either within any contractual agreement or memorandum of understanding (or any other similar formal understanding):

- Which party or parties are responsible for ensuring that the required integration and fairness testing are successfully completed prior to game release.
- Procedures to confirm that the required integration and fairness testing have been completed satisfactorily as appropriate. Where integration or fairness testing is conducted by the hardware provider and/or their agent, a record of the testing and result should be documented, including any test reports provided by a Commission accredited lab.
- Documentation (to be held by all relevant parties) to confirm that the game and/or component is compliant and/or has undergone successful testing, with sign-off and confirmation of receipt of the documents to ensure both entities receiving and sending the documentation are clear about the outcome of any integration and/or fairness testing, prior to game release.
- Who (position/party) is ultimately responsible for signing off the game as compliant in respect of the successful completion of integration and/or fairness testing. It would be expected that a PML or responsible person in the case of a small scale operator would sign off the game as compliant.

8.5 It should also be documented within the company policy and procedures (for testing purposes) as to who is responsible for the contract/memorandum of understanding or other similar formal understanding, and if amended, how those changes will be disseminated to appropriate staff to ensure that working practices replicate that agreed.

8.6 It is not required that both fairness and integration testing be signed off by a single party, however it would be expected that at least one party is in possession of all the testing outcomes to minimise the risk of game release prior to successful completion of all testing. The game should not be released into the market until such time that all testing has been completed to a satisfactory conclusion.

8.7 Additionally, to be permitted to carry out their own testing of gambling products the licensee(s) must follow good practice in the development and testing cycle for gaming machines (as set out at section 10 of the testing strategy). Any internal testing carried out must be documented for the purpose of any later audit by the Commission.

External testing

8.8 This option requires each cabinet and game combination to be tested via an external test house. This allows both fairness and integration testing to be carried out simultaneously.

Partial system integration testing carried out by an external testing house

8.9 Under this option each cabinet type undergoes system integration testing against a manufacturer's game software using an external testing laboratory (in particular the interface between the hardware and the game software). Provided that there are no modifications to the interface between the hardware and the game software then there would be no further system integration testing required for any subsequent new title. Game software is still required to undergo fairness testing as set out in the Commission's testing strategy.

- 8.10** To be permitted to carry out their own testing of gambling products the licensee must follow good practice in the development and testing cycle for gaming machines (as set out at section 10 of the testing strategy). Any internal testing carried out must be documented for the purpose of any later audit by the Commission.

9 Procedure for testing

Third party test houses

- 9.1** In June 2007 the Commission published a list of test houses that are approved to test gaming machines against its technical standards. The list, which can be found on the Commission's website at www.gamblingcommission.gov.uk, will be updated as new test houses are approved.
- 9.2** Licensees must send to the Commission on completion of satisfactory testing (but prior to release) the results of testing (ie a test house's summary report) to the following e-mail address: machinetestreports@gamblingcommission.gov.uk

Where practicable the Commission is content to receive this directly from the test house. Once this has been provided, the successfully tested product can be commercially exploited, subject to section 12 (site testing for commercial purposes).

- 9.3** Licensees on request will need to make available to the Commission the full test results supplied by the approved third party test house. Where practicable the Commission is content to receive this directly from the test house.

Testing conducted by Commission accredited lab

- 9.4** Where games are tested by a Commission accredited lab (including situations where the game is tested both by the manufacturer and Commission accredited lab) a Personal Management Licence (PML) holder or an appropriate company director in the case of a small scale operator (where there is no PML holder) must sign off the game (documented) as compliant, to the best of their knowledge and belief, prior to release.

Testing conducted by licensee/operator

- 9.5** To be permitted to carry out their own testing of gambling products the licensee should follow good practice in the development and testing cycle for gaming machines. Examples of what the Commission considers to be good practice can be found in section 10 below. Manufacturers can depart from the good practice set out in section 10, but must be able to demonstrate how their alternative procedures mitigate the risks associated with software development, implementation and testing procedures.
- 9.6** The Commission, on request or as part of a compliance visit, may require evidence from the licensee that it follows good practice and may inspect any documentation relating to the development and testing of any game title manufactured after 31 August 2007.
- 9.7** All results from licensee testing should be retained for 10 years after the final production of a game title and be made available to the Commission during compliance visits or on request. A summary of each game title approved in-house should be submitted to the Commission. The summary should include the game title, version number and confirmation that good practice procedures for development and testing are in place and that the standards and relevant DCMS regulations have been complied with. This must be signed as being the case by a Personal Management Licence (PML) holder or an appropriate company director in the case of a small scale operator (where there is no PML holder).

Game execution code testing

- 9.8** In all cases, the manufacturer and/or terminal supplier must ensure that suitable tests are conducted, whether carried out internally or externally by the manufacturer or Commission accredited test lab respectively, to confirm the correct operation of the executable game code, prior to release, as far as practicable.

10 In-house development, testing and release

Examples of good practice

- 10.1** Examples of good practice gaming machine and gambling software development are set out as follows.

10.2 Development process:

- Master source code should be held securely (such that the source cannot be tampered with by unauthorised persons).
- An audit log of all accesses to master source code should be maintained.
- Old versions of source code and the dates they were retired should be retained for 10 years.
- Access to source code by developers should be well controlled and based on a minimum access required for the job approach.
- Access to platform source code should not be granted to those working only on game specific development.
- Changes to critical modules must be logged and should be peer reviewed by an appropriately skilled independent person (who can be from the same company) to ensure all changes made are appropriate and in line with the change documentation. Any suspicious or unauthorised changes must be explained.

10.3 Testing process:

- Logically separate development and testing environments should be adopted.
- Separate staff to those that developed should perform the testing.
- An independent assessment of changes made by the developers should be performed (this can be performed by someone from the same company) to verify all changes are documented in the change documentation. This may involve the use of file comparison programs to quickly identify all changes.

11 Game variant testing

- 11.0** A 'game title' in the context of the testing strategy refers to each unique maths table made available, also described as 'game variants'. Each unique maths table must be considered a game in its own right and be tested in accordance with the requirement for a 'game title'.

- 11.1** In the case of random games it would be expected that, as a minimum, all target percentages available be confirmed, by testing, for each stake and prize combination.

- 11.2** In the case of compensated and/or controlled games it would be expected that, as a minimum, the extreme upper and lower target percentage and/or the most representative target percentage(s) available be confirmed, by testing, for each stake and prize combination.

- 11.3** Where games are required to be externally tested, the manufacturer may opt to test game variants themselves and provide appropriate data to the test lab for evaluation. The test lab may, on the direction of the manufacturer, test a sample of game variants to confirm that those reported by the manufacturer are true and accurate.

- The Commission does not intend to define the scope of sample testing required as that is a matter for the manufacturer and test lab to decide based on the complexity and range of game variants available. However it is expected that at least one of the variants is confirmed by external testing.

11.4 Manufacturers should ensure that any game variant testing conducted, either internally or externally is adequate for the purpose intended and in particular provides adequate assurances that any advertised 'return to player' (RTP) percentages are not misleading.

12 Site testing for commercial purposes

12.1 Commercial site testing of game titles prior to them being formally tested is permitted providing the following is adhered to:

- the manufacturer must follow good practice (examples are given above in section 10) in the development and approval of games for commercial site testing and take all reasonable steps to ensure that any test machine complies with applicable technical standards and regulations in force at the time it is manufactured.
- a maximum of 50 machines may be site tested.
- the testing must last no longer than sixteen weeks (taken from the date the first machine of that title is sited).
- the machines must be clearly identified as being on a commercial site test.
- the entity responsible for the test machine must also keep adequate records of the above, the site locations for inspection purposes and any modification made as a result of non-compliance with standards or regulations.

12.2 The Commission will keep commercial site testing under review and will amend these arrangements if necessary.

13 Change controls

13.1 Where a gaming machine's hardware or software is modified such that it could potentially affect the fairness of the game (for example, maths tables or game personality) or randomness (where applicable) then it must be resubmitted for testing to ensure compliance. Otherwise the machine need not be re-tested but any modification to hardware or software must be documented and signed as being compliant with the Commission's requirements by a PML holder or a company director in the case of a small scale operator.

13.2 Where the manufacturer tests the machine internally they must ensure that all reasonable steps are taken to ensure continued compliance with the technical standards and/or regulations.

13.3 Updated game version numbers must be submitted to the Commission and referenced against an existing game title prior to its release. Documentation relating to sections 13.1 and 13.2 above must be retained for a minimum of 10 years.

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Keeping gambling fair and safe for all

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