



防貪諮詢服務
Corruption Prevention
Advisory Service

INTEGRITY AND CORRUPTION PREVENTION GUIDE FOR NATIONAL SPORTS ASSOCIATIONS



5 APPLICATION OF TECHNOLOGY

The rapid advancement of technology has brought significant changes to the sports arena. From video review system and automated judging system to data analytics, technology has been instrumental in improving the objectivity, accuracy, and speed of decision-making in sports. Gambling on matches, regardless of legality, is not uncommon as it may bring monetary returns to the gamblers if the results of matches are favourable to their bets. This could be a catalyst for corrupt conducts by athletes and adjudicating officials. In respect of this, technology may serve as a potent tool in detecting anomalies and suspicious activities and combating match-fixing and other malpractices. Given the evident benefits, it is essential for NSAs to actively explore the application of technologies in their daily operations and in sports matches.

This Chapter highlights major corruption risks, identifies common inadequacies, and explores digitalised corruption prevention tools related to the control environment and the adjudication of sports matches.

Major Corruption Risks



- Manipulation of the results of competition through bribery or other means with a view to facilitating gambling activities (e.g. inducing athletes or adjudicating officials not to perform based on merits to achieve pre-determined results.)
- Undue advantage given to specific team/athlete in the adjudicating process (e.g. scoring, judging) due to insufficient controls on use of technologies.
- Corruption or other malpractice in applying technologies and electronic equipment in sports matches being covered up due to absence of effective reporting and monitoring mechanism.

Common Inadequacies



- ✗ Heavy reliance on manual process that is prone to human errors and inefficient, and involves individual judgement.
- ✗ Lack of clear policies, procedures or guidelines on applications of technologies in adjudicating matches.
- ✗ Inadequate accountability and traceability of adjudicating process (e.g. absence of audit trails and backup).
- ✗ Misuse of technologies and electronic equipment due to absence of guidelines and insufficient training.

5.1 CONTROL ENVIRONMENT

5.1.1 POLICIES AND PROCEDURES

- ▣ Lay down and promulgate clear guidelines and instructions, covering operation of the systems, staff member's roles and responsibilities, access control, information security, etc.
- ▣ If systems or electronic equipment are used during competitions, selection of athletes, management of coaches and adjudicating officials or other processes, ensure the corresponding rules, regulations, guidelines and instructions are reviewed and updated accordingly.
- ▣ Develop contingency plan in case the systems or electronic equipment do not operate as intended to avoid discretion or discrepancy in handling.

5.1.2 INFORMATION SECURITY

- ▣ Adopt clear classification of information and appropriate security measures for different classifications to minimise the risk of unauthorised access or disclosure (e.g. restrict access to video footage on a need-to-know principle to avoid tampering).
- ▣ Apply proper encryption to protect sensitive data from unauthorised access.

- Restrict the access to the systems and applications to designated staff members on a need-to-know basis using unique login accounts and passwords.
- Build in audit trail function for tracking access and changes to data, and regularly review the audit logs to detect any abuse of the systems (e.g. unauthorised access or tampering of video footage).
- Regularly review usage of individual user accounts to identify any irregularities or inactive user accounts warranting deactivation.
- Establish retention policy for data captured and maintained by the systems with a view to ensuring traceability.
- Backup data and video footage (e.g. to cloud data centre) on a regular basis to prevent data loss.

5.1.3 TRAININGS

- Provide mandatory training on the operation of the systems and use of electronic equipment to adjudicating officials and designated staff members.
- For critical and complicated systems, only qualified/certified persons are authorised to operate them.

5.2 TECHNOLOGIES IN ADJUDICATING SPORTS MATCHES

- Video-record all matches as far as practicable to enable traceability and facilitate objective and impartial adjudication.
- Consistently apply video review, electronic scoring equipment or automated judging system for all matches in the same league/tournament. Where it is impracticable, establish a mechanism or set out criteria for determining which match in the same league/tournament to apply such equipment or system.
- Conduct trial run prior to the matches to ensure proper functioning.

5.2.1 VIDEO REVIEW

5.2.1.1 *Functions*

- Record high-definition videos during the match, which may be used by officials to review the action (e.g. with functions of slow motion, zooming for close-ups) for

decision-making or to arbitrate the dispute/appeal.

- The recording should include date and time to ensure traceability.
- Examples of video review systems include Video Assistant Referee, Hawk-eye, Instant Review System.

5.2.1.2 Control Measures

- Appoint at least one video referee, with relevant qualification/certification, to oversee the operation of the system with a view to ensuring proper functioning and reliability.
- Before the match, determine the types of cameras (e.g. drone camera), locations and range of coverage, etc.
- Operate the video review system from the designated video review room where only the video referee and authorised staff members have access to.
- Ensure that the cameras are located in secure and unobstructed locations and positions at the venue to achieve pre-determined coverage.
- Put in place security controls on cameras, hard disk, monitors, video players and other associated equipment to avoid tampering.
- Set out clear procedures for initiating replay of video footage during the match, covering but not limited to the applicable scenarios, time limit, proposition methods and channels, maximum number of requests by each athlete/team in each match, communications with adjudicating officials and athletes, etc.
- Ensure the laid down applicable scenarios could effectively prevent abuse of video replay aiming at maliciously delaying or disrupting the normal course of the match.
- Lay down the authority for decision-making, e.g. video referee or event referee.
- Maintain sufficient documentation on the decisions made subsequent to video replay.
- Establish a mechanism for logging and cataloguing the video footage to facilitate, among others, data retrieval and analysis and post-match evaluation.
- Take proper and timely follow up actions based on results of post-match evaluation, e.g. taking appropriate actions to suspend athletes with misconduct from competing, and revoke the registration of an umpire for not adjudicating in good faith, arranging refresher courses for umpires who are unfamiliar with the rules of games.

5.2.2 ELECTRONIC SCORING EQUIPMENT

5.2.2.1 Functions

- ▣ Count score or measure time by sensors embedded in equipment which enhances accuracy and efficiency in scoring and measuring and minimises human errors.
- ▣ Examples of electronic scoring and measuring equipment include electronic scoring device and light sensors for fencing, sensing socks for taekwondo, aquatic timing system for swimming, snickometer for cricket, electronic distance measurement device for athletic field event, etc.

5.2.2.2 Control Measures

- ▣ Lay down the specifications and standards of qualified electronic scoring equipment to be used during the match.
- ▣ Maintain and publicise a list of electronic equipment as well as a list of manufacturers of electronic equipment accepted by the NSA.
- ▣ Establish a mechanism for checking whether the electronic scoring equipment to be used during the match meets the laid down specifications and standards.
- ▣ Lay down guidelines on the calibration and sensitivity of the electronic scoring equipment to prevent manipulation or altering of the equipment setting.
- ▣ For equipment requiring network to operate, ensure stable and steady network and signalling prior to the match.

5.2.3 AUTOMATED JUDGING SYSTEM

5.2.3.1 Functions

- ▣ Automate the scoring and judging process with the aid of advanced motion capture and recognition technology to minimise bias and subjectivity.
- ▣ Examples of automated judging system include artificial intelligence(AI)-assisted Judging Support System for artistic gymnastic and freestyle skiing.

5.2.3.2 Control Measures

- ▣ Ensure the criteria of scoring and judging (e.g. body movements for artistic gymnastic) are comprehensively and accurately input or programmed in the judging system.

- Lay down procedures and guidelines on modification of setting on scoring and judging in the system, covering criteria, submission of requests, implementation steps, approving authority, test steps, etc.
- Adopt adequate controls on access to and modification of parameters in the system, for example, multi-factor authentication, security token, etc.
- Put in place security controls on the system and associated equipment, e.g. 3D motion sensors, to avoid tampering.
- Illustrate how the system operates and disclose the scoring and judging basis to stakeholders with a view to enhancing transparency.
- Where the match result is based on the combined score rated by the automated judging system and adjudicating officials, pre-determine the respective contribution ratio.
- Conduct random review on the scores rated by the automated judging system based on pre-set standard procedures.
- Subject the system to periodic independent reviews or audit checks to ensure reliability and integrity.

5.3 TECHNOLOGIES IN DETECTING AND DETERRING MALPRACTICES

Apart from assisting the adjudicating duties in matches, NSAs may leverage on technology in detecting and deterring malpractices (e.g. match-fixing) in sports matches. Examples include –

- Engage an independent sports technology company to monitor sports matches on a real-time basis with a view to detecting match-fixing, fraud and doping and protecting integrity of sports competition. Such monitoring may cover in-play betting status in both legal and illegal markets (i.e. odds and betting pools), discussions in social media platforms and news.
- Apply AI in scrutinising game footage and analysing athletes' performance to detect and uncover dubious patterns and match-fixing.
- Use advanced equipment in detecting the use of unauthorised equipment (e.g. radio jammer, metallic wrist wrap) or presence of object (e.g. unauthorised personnel entering the sports ground) aiming to maliciously interfere the match.

- Leverage AI tools in selection of athletes with statistics and 3D visuals (e.g. field goal percentage for basketball, launch angle for baseball, trajectories for gymnastics, injury history) by tracking, analysing and predicting athletes' performance and decision-making process. This helps reduce the risk of manipulation in the selection process.
- Digitalise the ticket selling process to prevent unauthorised withholding of tickets and ticket scalping.