THE BROADCAST RESEARCH COUNCIL OF SOUTH AFRICA

TAMS TECHNICAL REPORT

1. Approach to TAM

The TAM system is based on seven steps of Television Audience Measurement.

These are:

The Establishment Survey

A large scale survey designed to define the characteristics of the population to be represented, and from which potential panel homes are drawn. The All Media Products Survey (AMPS) is used as until the new Establishment survey is ready for launch.

The TAM Panel

An appropriate number of households selected on the basis of a statistical design to represent the most important population characteristics.

The Peoplemeter

The electronic measurement system which monitors the channel that a TV set is tuned to and the individuals present in the room while the TV set is switched on. Individual demographics are captured through a complimentary specialized remote control.

Polling

Data transmission from the panel home to the production centre takes place between 02h00 and 06h00 daily, using either GPRS technology installed in the meter's transmission unit, or on rare occasions, the fixed telephone line in the home.

The Production Software

A data processing system which collects data, performs quality control, executes data validation and weighs the daily viewing data.

TV Events

TV Events is the broadcast monitoring or auditing system which supplies the programme and spot data that is merged with the viewing data to provide programme and spot ratings.

The Analysis Software

The mechanism through which TV audience data is delivered to data users for TV audience analysis.

2. TAM panel design and methodology

TAM Universe

The daily TAM data comprises adults 15 years and older, and children between the ages 4-14 years. All panel households must be private with Eskom mains electricity and a working TV set/s.

The panel is national and reflects the TV viewership of all people in private households, with Eskom mains electricity, with at least one working TV set.

Out-of-home TV viewing is not covered since a set Peoplemeter is used for measurement and data collection.

TAM Universe updates, using population and household figures from the establishment survey, occur annually. The Universe for DSTV households is updated concurrently using audited DSTV subscriber figures for the mid-fieldwork period of the Establishment Survey.

Sample Design

The TAM panel sample is drawn using an area stratified probability method. Names and addresses, as well as demographic data are sourced from the establishment survey.

A disproportionate sample design is applied where rural households make up only 20% of installed panel households, while rural households comprise a higher proportion in the South African TAM Universe.

Panel Controls

The representativeness of the TAM panel is maintained by controlling the demographic profile of the panel on a set of characteristics which are known to be good discriminators of viewing behaviour and attract different co-operation rates. These characteristics are referred to as panel controls.

Panel controls are necessary because both initial recruitment rates and subsequent attrition rates vary across different population subgroups.

Types of Controls

Two forms of panel controls are employed, namely:

Primary controls comprising a matrix formed by interlacing the highest priority controls:

- Community Size
- Province
- Home Language
- Access to TV services

Secondary controls are applied to ensure that the profile with respect to a number of additional demographics is maintained. All secondary controls are household based and are not interlaced:

- Household Size

Recruitment

The recruitment questionnaire is administered either face to face (80%) or by telephone (20%). The head of the household is targeted for interview, and in instances where he or she is not available, a suitable adult household member is interviewed.

The recruitment questionnaire is available on the Nielsen Pollux Recruitment Module, which is an online CAPI and CATI system.

Panel Turnover and Renewal

Panel turnover occurs by forced panel rotation and natural attrition:

Forced rotation is triggered when a household:

- Continues to be non-compliant after several attempts of re-education by the Nielsen quality control call centre.
- Falls within a demographic panel control that is over balanced or over installed.
- Exceeds a participation tenure of 8 years.

The main causes for natural attrition are:

- The relocation of a household to an area where the sample is balanced or over-installed.
- The household's electricity has been suspended for more than 6 weeks.
- The household no longer has a working TV set.

3. TAM panel management

Data Confidentiality

It is critical that the identity and characteristics of panel homes is kept confidential. A Panel Confidentiality Agreement is signed by Nielsen and the household at the point of installation.

Household Master File and Panel Member Contacts

Nielsen's production software system, Pollux, contains a central repository for all panel member classifications and records, including demographic and televisual household information. Each contact event to or from the household is captured on the master file.

Demographic and TV equipment updates

- **Update interviews** – are conducted with each household either face to face (15%) or telephonically (85%) twice per annum, and are administered by Nielsen's quality control staff members.
- **Helpline** – Panel members are requested to inform Nielsen of any demographic or televisual equipment changes by calling the telephone helpline, or by sending an sms text or email message.
- **Service call job cards** – TAM field technicians also submit household changes via the job cards that are returned daily to the Nielsen quality control department.

Panel Household Training and Education

Upon Installation, panel households are given a Welcome Pack and the TAM field technician coaches panel members on how to register the household member and guest viewing. Installation is followed by a Welcome Call by a quality control staff

member who ensures that the household understands what is expected in terms of participation on the TAM panel. Further education may take place at this stage.

TAM newsletters are distributed to panel households quarterly to entertain all members of the household and encourage "good button pushing" compliance. Each newsletter includes a central message for panel members. Topics include:

- How to register guest viewing.
- Encouraging the home to inform the Nielsen Call Centre when older children leave or return home.
- Just before and after important festivities that involve presenting gifts, households are particularly reminded to inform the Nielsen Call Centre of any new TV-related equipment they may have received.
- Reminders about how the reward system operates and how gifts can be claimed.
- Some form of entertainment for children (game, story, etc.)

Panel Member Incentives

Each TAM household receives a cash incentive, twice per annum. The cash is transferred into a cash card that is given to the household upon installation. The cash card is renewed every two years.

Smaller gifts such as notebooks, pens, mugs and calendars are also given to households from time to time.

Exit Study

When households are de-installed from the panel, an adult member of the household is requested to take part in an exit interview. Questions regarding how to improve the experience of a TAM panel household are asked. Results from this survey assist in strategic planning for future panel issues, including "button pushing" compliance, incentive schemes to panel literature; the long-term aim being to build a compliant continuous panel.

4. TAM quality control

Stringent quality control procedures are performed daily to warrant the integrity of the TAM data.

Quality control reports are run daily at an aggregated level, by home, by TV set and by panel member to identify and resolve issues of either a technical or behavioural nature. Data from households that are found to be non-compliant with respect to these parameters are excluded from the daily released data steam.

Technical compliance includes making sure that the metering equipment in each home is functioning optimally, and that all TVs and non-broadcast devices (i.e. DVD machines, set top boxes etc.) are metered.

Behavioural compliance involves ensuring that each eligible household member registers his or her viewing, as well as guest viewing, accurately.

Running In

Prior to its contribution to in-tab reporting, each newly installed home will undergo a minimum running-in period of 5 days. This evaluation period has two main functions:

• Allowing for initial experimentation within the panel home, before normative viewing behaviour and compliance continues.

• Ensuring that a technical review can be conducted to verify the quality of the meter installation.

Before a home is considered to have passed the "running in" process and permitted into production, its data will be assessed against the following set of minimum standards:

• To have polled successfully for most days.

• Not to have been rejected in the validation process during the "run in" period.

• To exhibit stable registering of viewing.

Quality Control Reports

Several quality control reports are generated daily to analyse the performance of panel households, following the editing and automated rejection rules. Typical quality control measures include the following:

- **Uncovered viewing** – when the TV set is on but no one is registered as viewing.

- **Long viewing sessions** – potentially related to behavioural and technical uncovered viewing sessions. This may be indicative that panel members are not logging off when leaving the room (for however short a period), or that there is a technical issue with the metering equipment.

- **Nil viewing by set** – a set that has not been viewed for a sustained period may be genuine; the set may be faulty; the equipment faulty or a particular individual in the home may not be complying (more likely with bedroom sets).

- **Nil viewing by home** – this may be related to nil viewing by set, but may also be indicative of polling or communication problems within the metering equipment.

- **Nil viewing by individual** – a panel member has not watched TV for a sustained period; this may be genuine; the individual is no longer part of the family; the individual is not pressing his or her button; it could be also indicative of faulty equipment.

- **No reference/unknown channel** – audio signatures cannot be matched against reference content; audio signatures are on a different source from the source registered on HH master for that TV set/home. The viewing missed from the total TV content should not exceed 1%; if it does then immediate action must be taken to identify and resolve the problem.

Quality Control Remedies

Whether for newly installed or longer-term homes, action is taken to resolve the technical or behavioural issues that have been identified:

- Retaining the home on a monitoring basis until more data is collected. Such households are excluded from production during the monitoring period.
- Calling the household to complete the diagnosis of any concerns and take remedial action.
- Pass the home directly to the TAM field technician in the event of a more significant issue that requires a visit to the household to rectify.
- In the case of repeated non-compliance, particularly behavioural issues, it may be necessary to remove a home from the panel if re-educations have failed to produce change.

Coincidental Study

Ongoing Coincidental checks are conducted. The aim of this survey is to provide a snapshot of the accuracy of the metered data by comparing respondent claims made at the point of the survey versus the raw meter statement of the home.

Each panel member's behaviour will be coded under the following labels:

a) Person watching and button pressed

b) Person watching and button not pressed

c) Person not watching and button pressed

d) Person not watching and button not pressed

Household co-incidental scores are then aggregated to produce an overall compliance score for the panel.

5. Hardware description and operation

Set Meter Panel

A set meter is an electronic device which is able to measure all TV set activity by capturing the audio stream of the viewing session. It is a device that is attached to every TV set in the sample households and picks up all TV transmissions in the household.

A remote control unit is used to identify which members in the household are viewing.

Currently there are two types of meters installed in the TAM Panel:

- The UNITAM Meter
- The TVM 5 Meter

TVM5 System Description

The TVM5 System consists of a TVM5 base unit, display unit, remote control, transmission unit, and corresponding connections.

The most important features of the TVM5 System are:

- Non-intrusiveness,
- Reliability, and
- Ease of installation

Display unit and Remote control

The Display unit and the TVM5 remote control are the interface between the panel members and the meter. The Display unit has to be placed in the most convenient point that allows best visibility. Preferably on top of the TV set, this point also being most suitable for the RF module, RF communication link from the Meter to the Transmission Unit. The RF module is housed in the same plastic casing with the Display Unit.

Base Unit

The Base unit is the core of the metering equipment that detects and stores all information concerning the viewing habits of the panel members. The TVM5 System requires that a Peoplemeter (Base Unit and Display Unit) be connected to all the TV sets and TV equipment (VCR, Digital Decoder, DVD player, etc.) in the home. The viewing data or statements generated, is stored in the memory of each of the Peoplemeters installed. This viewing data is progressively transmitted via the Display RF communication link to the Transmission Unit as mentioned above.

The basic information gathered by the TVM5 is:

- On/Off time of the TV set,
- The selected source of viewing i.e. TV set, VCR, Digital Decoder, or DVD player,
- The selected channel,
- Diagnostic Statements as motion detection, panel member interference with the installation, etc.

(The above category of statements are automatically detected and stored without intervention of the panel member).

- Identification of panel member viewer,
- Arrival and leaving time of panel member viewer,
- Identification of sex and age of visiting guest viewer,
- Arrival and leaving time of guest viewer, and

- Departure of the family for holiday

(The above category of statements require input action from the panel member by using the remote control which is provided with each meter)

Transmission Unit (TU)

The Transmission Unit has two main functions:

- To connect to the TVM5 Meter(s) via RF communication, and
- To connect to Host Server by Land Line / GSM network / Internet Connection

The TU polls the recorded viewing data from one or more TVM5 Meters through the RF communication link and also stores the polled viewing data.

The TU has the ability to be called by / or to call the Host Server at certain predetermined time periods (time-slots) during the night, in order to download the viewing data statements. The connection to the Host Server is made by either Land Line / GSM network or Internet Connection (GPRS).

TVM5 Principles of Measurement

The identification of a channel is performed in two steps:

- Source identification (TV set tuner, Digital Decoder, VCR, DVD, etc.), and
- Broadcast identification (channel number, channel name or Service Information (SI) that is related to a channel)

The methods used for channel identification are given below. Some are used for both (Source and Broadcast ID) while some are used just to identify a certain state of a device.

Service Information (SI)

This method of channel identification requires modification of the Digital Receiver / Decoder or Set Top Box (STB) software and sometimes hardware, so that the SI information will be available on an RS232 output immediately after channel change and from then on periodically. This obviously necessitates co-operation from the STB manufacturer and Broadcaster.

The TVM5 detects the source and identifies the Channel generated by the STB present on the TV screen, by capturing the SI from the STB. The SI used to identify the Channel is known as a 'Triplet' and is unique for every available Channel on the STB.

The Triplet is a hexadecimal number made up of 'Network ID', 'Transport Steam ID' and 'Service ID'.

Image capturing or Banner Recognition

Image capturing can be divided into two layers:

- The first layer is hardware based and is used to capture the whole image even the hidden lines, and
- The second layer which is software based, processes the captured image

The fact that the second layer is software based, gives the flexibility to detect various signs and patterns in the image, which identify a channel. Character recognition is the most used image processing to identify the channel. Beside the character recognition, there are also other possibilities. Any permanent unique pattern present in the video image can be a potential for channel identification.

UNITAM System Description

The UNITAM system's core audio tracking technology can be implemented in new types of meters, providing a set of different capturing devices and methods to cover various types of media consumption situations.

UNITAM Channel Identification Methods

UNITAM uses two main methods of channel identification that are totally independent (i.e., they do not require any cooperation on the side of the broadcasters): audio tracking and InfraRed streams processing.

Audio Tracking

Audio tracking is based on a proprietary content identification technology at its core called "Content Tracking System" or "CTS". CTS comprises a set of techniques and methods that can recognise an unknown clip of audio material among a virtually unlimited number of reference clips generated from known audio streams. In order to do this, CTS converts the audio signal into 'signatures', a continuous, low-bandwidth digital stream that uniquely characterises the given audio material. A powerful pattern correlation engine within CTS is then used to identify an unknown piece of content, by scanning its 'new' signatures against a large set of previously generated reference signatures. The right content is identified through analysing the correlation values according to proprietary algorithms. One of the distinctive features of UNITAM tracking technology is given by its binary output (either a perfect match or no match at all). This provides extremely stable data and accurate viewing data.

Infrared Streams Processing

Besides the audio signature stream, UNITAM meters produce a parallel stream of information captured from all remote controls used in conjunction with the measured TV ("infrared stream").

This second stream of information is processed in combination with the audio stream to provide more detailed information about the viewing session, including for example, Teletext usage, interactivity, fast channel surfing, and other types of "click through" activities. The infrared stream is also an effective way to avoid any ambiguity when reporting viewing situations in which two or more channels may be transmitting the same signal (i.e., same audio track in "simulcast" channels). For this purpose, the UNITAM system automatically follows every action performed by all remote controls in the vicinity of the TV set under measurement, and uses this information to resolve the ambiguity by determining the actual broadcast among various matching candidates.

UNITAM Installation

In a typical set-up, the following equipment is installed at the panel household:

• UNITAM meter unit: an electronic device designed for monitoring TV set, VCRs, PVRs/ DVRs, Set Top Boxes, tuners, DVD players, games consoles and PC's.

Front view of UNITAM Meter

• **Remote Control:** a device used by the panel members (and guests) to register all their viewing activity (identification of the panel members who are watching and changes in their viewing activity).
• **Combox Unit:** an electronic device that polls all the meters installed in the panel household via Radio Frequency communication and collects the data generated. The Combox stores the collected data and sends it to the base server via telephone communication.

The Combox is protected against power failure with a battery backup, and can store in its 2MB memory more than 200 hours of viewing information. UNITAM meters are equipped with up to 8 ports that are connected to every media device capable of delivering content present in the TV by using special cables that are inserted into the signal path at the output of each device, without disturbing in any way the signal as it flows towards the TV set. In this respect, UNITAM meters are 100% nonintrusive (no TV sets or devices need to be opened or modified in any way), in that they simply require a by-pass connection, which is inserted into the audio signal path and a

'transparent' antenna connection (UNITAM meters also include internal TV tuners that are used in several ways to complement its functions).

Rear View of the UNITAM Meter

As part of the installation process, the field technician records which type of device is connected to each port. This 'device type' value is used by the central system to determine which type of recognition process, if any, is to be applied to the signatures.

UNITAM meters also include a 'sensor' port that must be connected to the TV set's audio output if available, or otherwise to a tiny microphone attached to the TV set's speaker. This port is used for "source detection" purposes. This permits identification of the platform or device being viewed. Once the active port has been determined, the meter generates audio signatures continuously from that port, as long as it remains active, regardless of the type of device connected to it. These signatures are transmitted to the base office during the daily polling process.

UNITAM Remote Control and Display

UNITAM Remote Control: Each UNITAM meter has a dedicated remote control, which is user-friendly and suitable for all age groups. All household members have a dedicated button on the remote control and are registered by the UNITAM Peoplemeter accordingly. There is a very simple procedure for guests to log on, also indicating sex and age for further analysis. UNITAM meters are capable of recording data to the second, 24 hours per day and apply a persistence threshold of 15 seconds.
UNITAM Meter Display: The UNITAM meter has an 80×8 dot LED display for messages in text, and includes an optional buzzer that can be turned on or off by the meter software in order to enhance the panel member's compliance. Feedback for all panel members button pushing is provided by the graphic display of the meter. The meter can support multiple languages.

During the TV session the meter reminds the panel members to declare the presence of new viewers, if any, every 30 minutes.

UNITAM Data Transmission – COMBOX

When more than one TV set needs to be measured, a UNITAM Combox is installed in each household. The Combox is an electronic device that polls all the meters installed in the home via RF communication (DECT) and collects the data generated by them. The Combox stores the collected data and sends it to the central processing site. Signatures out of the captured content which are then sent to a central processing site via a GPRS connection. Quantum also includes a custom user interface through which

panel members declare their presence in front of the TV. In this UNITAM Quantum is a movable people meter to be inside the home.

UNITAM Reference Site

A reference site is simply a collection of receivers connected to meters which generate audio signatures for each channel to be monitored, and PC's to gather these generated audio signatures. Each channel to be monitored requires its own separate feed, via a decoder, which then feeds into a reference unit, which generates the audio signature and stores it on the server. The UNITAM reference site is constantly monitored by the surveillance software which makes sure that each decoder is actually tuned to the correct channel and is in fact providing an output. If the surveillance system suspects that a decoder has stopped working or some other issue, then it can be programmed to send an e-mail or SMS messages to Nielsen operations staff warning that there could be a problem with that particular station. The problem can then be rectified immediately.

A backup reference site will exist in an off-site secure location. This site will serve as a disaster recovery system.

6. Daily weighting of TAM data

RIM Weighting: Household Pre-weight

Each day is treated as new survey by Pollux, and is re-weighted to the population on a daily basis. The reason is that each day inevitably sees households coming back to report after a period of non-reporting or reliably reporting households dropping off the panel because of meter problems, lightning strikes, telephone suspensions, or non-compliance issues etc.

Each new day could therefore potentially see skews within the panel, because the sample is deviating from the 'ideal'. The daily weighting process removes these skews from each of the weighting variables by weighting each RIM to the correct population size.

The RIM method firstly weights the good reporting households to Household population; this is known as the "Pre-weight" as it this process produces a weighted household population base, with skews removed, which becomes the input to the second stage, the individual weighting procedure. Then Pollux performs 50 iterations of the data, to arrive at its final 'best fit' for that day.

The current RIM weight structure for households is:

HOUSEHOLDS WEIGHTING RIM	
COMMUNITY SIZE	LIVING STANDARD MEASURE
Metro	LSM 1 - 5
C/LT	LSM 6
ST/V	LSM 7
Rural	LSM 8
	LSM 9
PROVINCE	LSM 10
Western Cape	
Northern Cape	
Free State	
Eastern Cape	HOUSEHOLD SIZE
Kwazulu-Natal	HH Size 1 to 3 members
Mpumalanga	HH Size 4 to 5 members
Limpopo	HH Size 6+ members
Gauteng	
North-West	
	NON DSTV AND DSTV
HOME LANGUAGE	DSTV
Afrikaans/Both	NON DSTV
English/Other	

Nguni	**NON DSTV PVR AND DSTV PVR**
Sotho	**PVR**
	NON PVR

The current RIM weight structure for Individuals is:

INDIVIDUALS WEIGHTING RIM	
GENDER	**AGE GROUP**
Total Males	**Age 04 – 06**
Total Females	**Age 07 – 10**
	Age 11 – 14
PROVINCE	**Age 15 – 24**
Western Cape	**Age 25 – 34**
Northern Cape	**Age 35 – 49**
Free State	**Age 50-64**
Eastern Cape	**Age 65 +**
Kwazulu-Natal	
Mpumalanga	**COMMUNITY SIZE**
Limpopo	**Metro**
Gauteng	**C/LT**
North-West	**ST/V**
	Rural
HOME LANGUAGE	
Afrikaans/Both	**NON DSTV AND DSTV**

English/Other	**DSTV**
Nguni	**NON DSTV**
Sotho	
	NON DSTV PVR AND DSTV PVR
LIVING STANDARD MEASURE	**PVR YES Ind new**
LSM 1 -4	**PVR NO Ind new**
LSM 5	
LSM 6	
LSM 7	
LSM 8	
LSM 9	
LSM 10	

Calculating Universe Estimates

A Universe Estimate (UE) is the estimated population of the Television Audience Measurement (TAM) in each market.

Definition of Fixed & Floating Universes

A demographic with a "fixed universe estimate" will have the daily sum of weights equal the published Universe Estimate (UE). This demographic is used in calculating the daily weights and is referred to as a "weighting demographic".

Conversely, a demographic with a "floating universe estimate" will not have the daily sum of weights equal to the published UE as they may vary every day.

7. Daily production and reporting

In overview, the following takes place:

- The data are polled starting at 02H00 every morning, 7 days a week,

- Polling finishes at 06H00

Post polling takes all the polled raw data, and runs the validation checks on all households, at this stage households are rejected e.g. new households 'on directory' but not yet allowed into production, null viewers, constant viewing for 24 hours and unknown channel where a TV frequency is unrecognised by the meter.

Polling reports are accessed to establish how many good reporting households there are [from UNITAM and TVM5 polling]:

- The performance statistics of each of the polling modems is checked,
- The Pollux validation summary of rejected households is checked,
- Then Pollux produces the industry output files next [TX3 and D_TX3],
- A converter then produces the ratings file

Every weekday morning TV Events supervisor completes 'closing the day' at 10H00 daily. The TV Events data for a particular day is exported as RF, TEL and AIS files. Batch files are run to convert the data for the industry data analysis software providers. The necessary files are then put up on the FTP server for clients to access.

The Edit Rules

The edit rules being applied are those that allow the 'raw' data to come through with as little change as possible, with editing out or flagging only suspect viewing behaviour.

Current Edit Rules

- "Uncovered Viewing": The permissible sum of all the gaps in viewing time [this is 'uncovered viewing' – where the TV set is switched on but no one is logged in] has been set to reject any household where total logged in time was less than 10% of total time switched on. The upper limit to the fatal gap and permissible logged-in percentage may be adjusted from time to time. (The South African situation is different from many countries in that TV sets are often left on for security reasons when panel members leave the house. There is also reason to believe that the TV is used to calm pets or babies.)
- All gaps [leading, embedded and trailing] have been disabled.
- All VCR tuning and any DVD playback is captured and recorded under 'VCR' or "DVD', but none of this viewership is included in the daily viewing statistics.

- Invalid Channel (unknown frequency): If a household views an unknown frequency, and viewership exceeds the set threshold, the household is rejected from the daily in-tab.
- Constant Viewing: If a household views TV for the full 24 hours, by one or more members, the household is rejected from the daily in-tab.

Any demographic which is not a weighting demographic or cannot be formed by a combination of weighting demographics is considered a floating demographic.

Week Numbering Convention

Originally TAM data used the weekly and the old week numbering system. Since the move to daily reporting, the week number is not stated specifically, rather the actual date.

In the interest of keeping the industry in sync, the ISO weekly convention is followed. The 1st week of any year is the 1stweek which contains a "Thursday", therefore any week at the end of the year which has overflowed into the next year, which does not contain a Thursday, automatically becomes either week 52 or 53, of the previous year.
The week number can be identified by counting the Thursdays. Week 12 contains the 12th Thursday of the year and every week begins on a Monday without exception.

8. TAM reporting variables

Calculating Floating Universe Estimates (Average Daily UE)

If a fixed Universe Estimate does not exist for a particular demographic, then there is a need to calculate a floating Universe Estimate for that demographic for the schedule.

Loop through all the spots in the schedule and accumulate the *Sum of Weights* for each demographic, on each unique day, and divide this figure by the number of unique days in the schedule (e.g. if 2 spots in the schedule fall on the same day will be counted as 1 unique day). This is called the *Floating Average UE*.

Formula

$$Floating\ Average\ UE\ (Demo) = \frac{\sum SOW\ (Day, Demo)}{Days}$$

Where:

Demo = Demographic count in the schedule from 1 to n
Days = Total Number of unique days in the schedule
SOW = Sum of weights per unique day of the schedule per demo
Day = Unique day in the schedule

Calculating UE for Overlapping Years

If a schedule contains spots that span a date period of over 1 year, then the *Universe Estimate* to use shall continue to be the Average spot UE.
If the Universe estimate does not exist, then use the above rule (floating UE) to calculate the *Average UE*.

TV Rating

Average number of individuals who have seen a specific event or daypart.

Formulas:

Absolute (000s):

$$\text{TVR} = \frac{\sum_{i \in I} \text{weight}_i * \text{viewing}_i}{\text{duration}}$$

Percentage (%):

$$TVR\% = \left(\frac{TVR}{Univ}\right) * 100$$

Where:

i = individuals of the target
$weight_i$ = daily weight of individual i
$viewing_i$ = viewed seconds of individual i on program/daypart
duration = duration of program/daypart
Univ = daily Universe

Calculation Rules:

For calculations of TVR for a group of events or dayparts the duration of each event / daypart is considered in the calculation of the Average TVR (weighted by duration). The TVR% on a group of events is divided by the average daily universe (averaged by the number of daily events).

The Average by duration is calculated as:

$$TVR = \frac{\sum_{p \in P}(TVR_p * Dur_p)}{\sum_{p \in P} Dur_p}$$

$$TVR\% = TVR * 100 * \frac{N}{\sum_{p=1}^{N} Univ_p}$$

ATV (Average Time Viewed)

Average number of minutes seen by any individual

Formulas:	Absolute (000s):	Percentage (%):
	$ATV = \frac{TVR * Dur}{Univ}$	$ATV\% = \frac{TVR}{Univ}$
Where:	*Dur = duration of program/daypart* *Univ = daily Universe*	
Calculation Rules:	On a group of events or day parts it is calculated as average weighted by duration.	

ATS (Average Time Spent)

Average number of minutes seen by each viewer

Formulas:	Absolute (000s):	Percentage (%):
	$ATS = \frac{TVR * Dur}{RCH}$	$ATS\% = \frac{TVR}{RCH}$
Where:	*Dur = duration of program/daypart*	
Calculation Rules:	On a group of events or day parts it is calculated as average weighted by duration	

TTVR (Total Television Rating)

Average number of individuals watching TV

Formulas:	Absolute (000s):	Percentage (%):
	$\mathrm{TVR} = \frac{\sum_{i \in I} \mathrm{weight_i} * \mathrm{viewing_i}}{\mathrm{duration}}$	$TVR\% = \frac{TVR}{Univ}$
Where:	*i = individuals of the target* *$weight_i$ = daily weight of individual i* *$viewing_i$ = seconds of individual i with TV on* *duration = duration of program/daypart* *Univ = daily Universe*	
Calculation Rules:	On a group of events or day parts it is calculated as average weighted by duration	

SHR (Share)

Proportion of individuals viewing a program or day part on the total number of individuals watching TV at that time

Formulas:	Percentage (%):
	$SHR = \frac{TVR}{TTVR}$
Calculation Rules:	On a group of events or day parts it is calculated as the proportion of average TVR and average TTVR

RCH (Reach)

Number of individuals having seen greater than 15 seconds of an event or daypart

Formulas:	Absolute (000s):	Percentage (%):
	$RCH = \sum_{i \in I} weight_i$	$RCH\% = \frac{RCH}{Univ}$
Where:	*i = individuals of the target* *$weight_i$ = weight of individual I having seen the specified viewing threshold* *Univ = daily Universe*	
Calculation Rules:	No threshold is defined The reach and universe are calculated with daily weights and universe. Average reach: the average reach is calculated as average by duration. In Reach and Frequency average weights are used.	

Effective Reach (*n+*, *n-m*) [Synonyms: effective reach, reach *n+*]

Number of different individuals having seen at least *n* or a range *n-m* tv-items of the schedule

Formulas:	Absolute (000s):	Percentage (%):
	$EffRCH_{n+,n-m} = \sum_{i \in I} weight_i$	$EffRCH_{n+,n-m}\% = \frac{EffRCH_{n+,n-m}}{Univ}$
Where:	*i = individuals of the target* *n+ =at least n ; n-m=frequency corridor* *$weight_i$ = weight of individual having seen exactly n items* *Univ = target Universe*	
Calculation Rules:	No threshold is defined The reach and universe are calculated with daily weights and universe. Average reach: the average reach is calculated as average by duration In Reach and Frequency average weights are used.	

GRP (Gross Rating Point)

Total number of contacts

Formulas:	Absolute (000s):	Percentage (%):
	$GRPabs = \sum_{i \in I} weight_i$	$GRP = \frac{GRPabs}{Univ}$
Where:	*i = individuals of the target* *$weight_i$ = daily weight of spot viewers* *Univ = daily Universe*	
Calculation Rules:	GRP is calculated with daily individual weights. The GRP of a campaign or group of spots is the sum of each spot's GRP (in absolute or percentage).	
Country Specifics:	-South Africa: $GRP = \frac{\sum_{i \in I} weight_i * viewing_i}{duration}$	

GRP per Spot

Average spot rating

Formulas:	Absolute (000s):	Percentage (%):
	$GRPabsSpot = \frac{GRPabs}{Insertions}$	$GRPSpot = \frac{GRP}{Insertions}$

OTS (Opportunity to see)

Average number of spots seen by the viewers

Formulas:	Absolute (000s):
	$OTS = \frac{GRPabs}{RCH}$
Calculation Rules:	OTS is the proportion between campaign's absolute GRP and Reach

Cost/GRP – Cost per 000

Cost per rating

Formulas:	Absolute (000s):	Percentage (%):
	$CostGRP = {Ivestment}/{GRP}$	$Cost000 = {Investment}/{GRPabs}$
Calculation Rules:	For a campaign or group of spots the Cost per rating is the total investment by total rating	

30" CPP (Equivalent Cost per Point)

Equivalent cost per GRP

Usage (Why): The Equivalent cost per rating point is the estimator of Cost efficiency of campaigns

Formulas:	Absolute (000s):	Percentage (%):
	$EqCostGRP = \frac{Eq.Investment}{GRPabs}$	$30"\ CPP = \frac{Eq.Investment}{GRP}$
Calculation Rules:	For a campaign or group of spots the Eq. cost per point is calculated as the total eq. investment by the total GRP.	

IMPROVEMENTS TO TAM PANEL MANAGEMENT

BACKGROUND

- In order to achieve TAM Key Performance Indicators and improve the quality of the TAM Panel, more stringent panel management rules have been applied.
- This has resulted in **higher levels of forced-turnover** of panel households, over the last 2 years. Higher forced-turnover means that a greater number of households need to be recruited to replace the households that have been removed from the panel. Furthermore, a bigger number of meters will be in-transit since meters need to be transported from the places of de-installation to the location where a new installation has been scheduled.
- Rigorous Panel Management procedures and prompt remedial action also results in **households being called and visited more frequently.** However, care must also be taken not to over-burden TAM Households with too much contact.

PANEL MANAGEMENT PROCEDURES

Below are some of the primary Panel Management tasks undertaken to achieve the TAM KPI's:

- **Achieving TV Coverage > 90%:** In order to meet this target, Nielsen field technicians will not install metering equipment into any panel households that refuse to have all TV sets in home monitored. Similarly, existing households that will not permit all TV sets to be covered, are being removed. This results in higher levels of cancellation upon attempt of installation and higher forced-turnover.

- **Panel Balance and Weighting Efficiency**: To maintain panel representivity as measured by Panel Balance and Weighting Efficiency, Nielsen undertakes continuous, but stable de-installation of households that are over-represented on the panel, and then recruit and install into panel households that are under-represented. Panel imbalances occur mainly because:
    - Different demographic groups have different levels of compliance, where some households will experience higher rates or forced and natural turnover.
    - The Universe is updated twice per annum and the TAM household sample is revised to match the new Universe.

- **Maximum Panel Tenure of 8 years:** More than 300 Panel households, exceeding a tenure of 8 years have been identified and de-installed, since June 2014. This has contributed to higher levels of forced-turnover and a greater demand for fresh recruits and new installs.
- **Achieving an intab level of > 90%:** The following mandatory panel rules and tasks have been implemented to ensure an intab of 90% :

- Placing households with no working TV set on a Quarantine status. Since the TAM Universe by definition includes households with at least one working TV set, TAM households that report no working TV sets are temporarily removed from the actively installed panel. If a household fails to have the TV repaired after 6 weeks, then the household is removed permanently. The number of TV households on this Quarantined status ranges from 25 to 45 households, in any given week.
- Monitoring and replacement of peoplemeter batteries. Due to the high level of power outages in the South African TV environment, Nielsen field technicians will inspect the peoplemeter battery upon every household visit. Batteries that have a low charge or are faulty are removed immediately and new batteries are inserted into the meter, allowing households to poll even if there are power outages during the polling window. In addition, low charge and faulty meter batteries are detected remotely via tests and QC reports.
- Households that fail to poll for 2 consecutive days are called by the Nielsen call centre agent and asked to re-set their meter. If the meter fails to poll for a 3rd consecutive day, a job card is opened for a Nielsen field technician to visit to the household.

- Data integrity for newly installed households. When a new household is installed it is put On Trial for a minimum of 5 days. The household members are thus given time to become familiar with the metering equipment and with registering their viewing via the Nielsen remote control. The household is closely monitored by a QC Analyst and re-educated if necessary. Once the QC Analyst is satisfied that the household is fully compliant, he/she will put the household on a live status for reporting.

Several quality control reports are generated daily to analyse the performance of panel households, following the editing and automated rejection rules. These are:

- Uncovered viewing – when the TV set is on but no one is registered as viewing.
- Long viewing sessions – potentially related to behavioural and technical uncovered viewing sessions. This may be indicative that panel members are not logging off when leaving the room (for however short a period), or that there is a technical issue with the metering equipment.
- Nil viewing by set – a set that has not been viewed for a sustained period may be genuine; the set may be faulty; the equipment faulty or a particular individual in the home may not be complying (more likely with bedroom sets).
- Nil viewing by home – this may be related to nil viewing by set, but may also be indicative of polling or communication problems within the metering equipment.

- Nil viewing by individual – a panel member has not watched TV for a sustained period; this may be genuine; the individual is no longer part of the family;

the individual is not pressing his or her button; it could be also indicative of faulty equipment.

- No reference/unknown channel – audio signatures cannot be matched against reference content; audio signatures are on a different source from the source registered on HH master for that TV set/home. The viewing missed from the total TV content should not exceed 1%; if it does then immediate action must be taken to identify and resolve the problem.

Quality Control Remedies

- Action is taken to resolve the technical or behavioural issues that have been identified:
- Retaining the home on a monitoring basis until more data is collected. Such households are excluded from production during the monitoring period.
- Calling the household to complete the diagnosis of any concerns and take remedial action.
- Pass the home directly to the TAM field technician in the event of a more significant issue that requires a visit to the household to rectify.
- In the case of repeated non-compliance, it may be necessary to remove a home from the panel.