INTERFERENCE MANAGEMENT PROTOCOL FOR CAPE TOWN TVWS TRIAL

The CSIR Meraka is making all efforts to mitigate any harmful interference to the primary users (TV viewers) of the TV spectrum during the period of the TVWS trials in Cape Town. This includes initial field measurements (to identify free channels), equipment testing in the lab, using the RF predictions and making sure that only the available TV channels are accessed or utilized for trial purposes. However, due to uncertainties in the wireless environment and the different causes of interference, it is possible for the TV viewers to experience some interference due to secondary access of the adjacent channels or the same channels (co-channel). If such interferences are experienced by the primary users, the following protocol should be followed to mitigate interference caused by the TVWS trial network. The TVWS trial network consists of three Base Stations (BS) and ten Radio Terminals (RT). Both the BS and RT are referred to as white space devices (WSD).

Table 1: Interference Management Protocol

Steps		Procedures to be followed	ICASA Online reporting
Step 1		A normal poor TV quality reception problem (such as interference) reporting procedure will be followed by the TV Viewer (subscribers).	N/A
Step 2		The broadcaster will follow its internal processes to investigate whether the problem is due to interference or not. If it is interference problem, the broadcaster should determine whether the area where interference is reported is in the vicinity of the TVWS trial network.	N/A
Step 3		If interference is in the vicinity of the TVWS trial network, then the broadcaster will notify CSIR about the possible interference by the TVWS trial network.	Broadcaster to log an online report.
Step 4		CSIR and the broadcaster will cooperate to perform the following tests to determine whether or not the WSDs are causing interference.	CSIR to log an online report.
	Test i	CSIR will switch-OFF the WSDs sector by sector and inform the broadcaster	N/A
	Test ii	The broadcaster will check with the TV Viewer whether the interference has been cleared.	N/A
	Test iii	If the interference is cleared (while the WSDs are switched-OFF), the CSIR will switch-ON the WSD again (on the same channel) and check with the broadcaster whether the TV Viewer still experience interference or not. If the TV Viewer no longer experiences interference (i.e. interference is cleared), Go to Step 6.	N/A
	Test iv	If the TV viewer still experiences interference, repeat Tests i, ii and iii (Repeat only once).	N/A
	Test v	If the TV Viewer still experiences interference, CSIR will switch/change the TVWS trial network channel and transmit on the new/different channel.	N/A
	Test vi	If the interference continues (not cleared) on the new channel (after Test v), CSIR will switch-OFF the entire TVWS trial network and go to Step 5.	N/A

		If the TV Viewer no longer experience the interference, Go to Step 5	
Step 5		If the procedure/testing in Step 4 reveal that TVWS trial network may have caused the problem, CSIR will conduct the investigation and report the problem to ICASA, clearly indicating the source of the problem and how it was resolved.	CSIR to log an online report to ICASA
Step 6		If the interference is not caused by TVWS trial network, broadcaster will report the problem to ICASA using the normal procedure to deal with such problems.	Broadcaster to log an online report to ICASA
Step 7		Once interference is cleared, the CSIR will switch-ON the entire TVWS trial network if it was switched-OFF (and report to ICASA)	CSIR to log an online report to ICASA
Step 8		ICASA will also use their existing internal investigations to study the cause of the interference and confirm whether CSIR has cleared the problem.	ICASA to report back to Broadcaster and CSIR

Figure 1 depicts a flow diagram for the interference management protocol discussed above.

The above protocol shall be in place for the duration of the TVWS trial (i.e. the TVWS trial network is still active). In addition to the protocol, the process in Annexure A shall be in place to fast track interference mitigation.
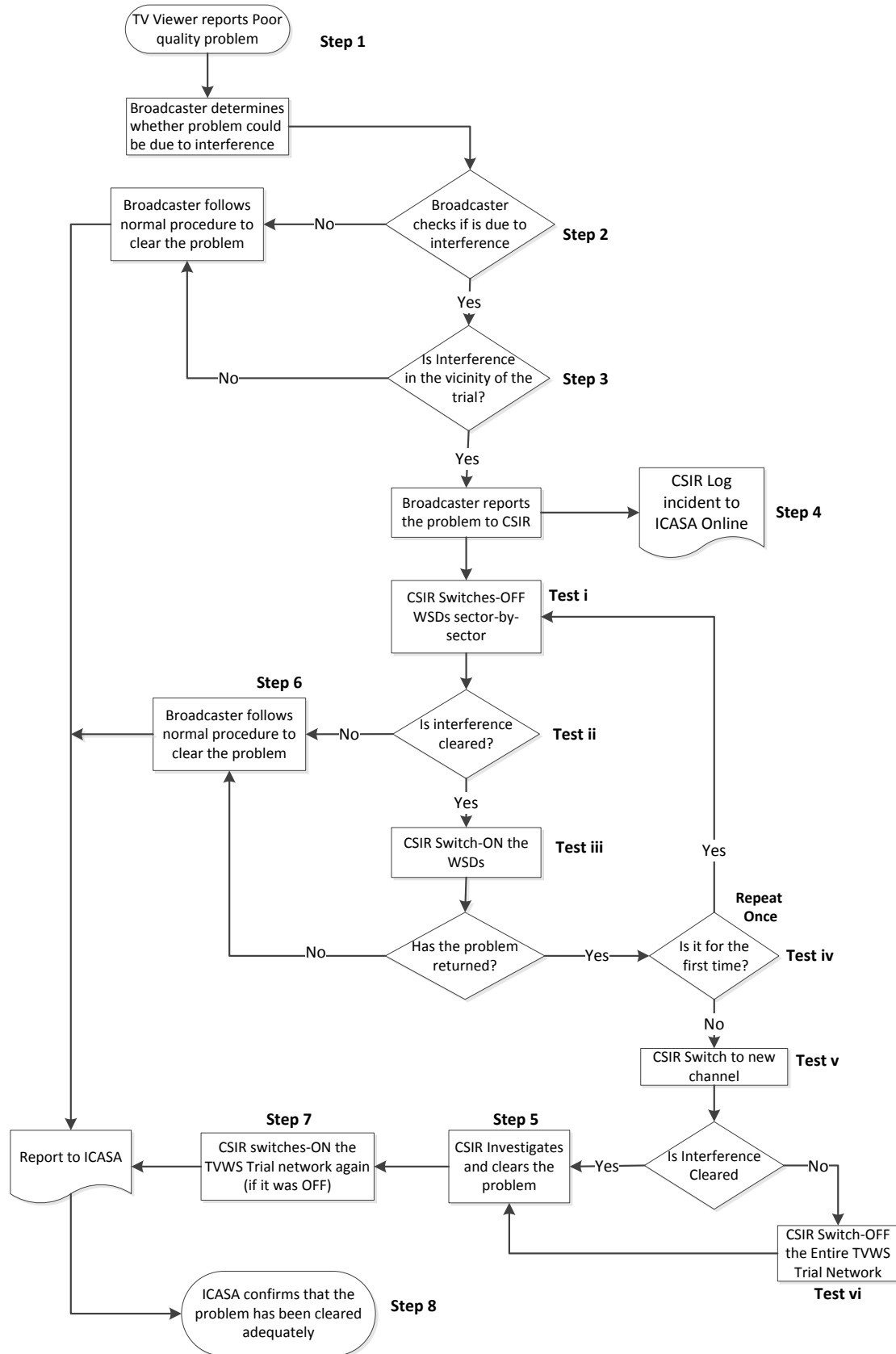
Figure 1: Interference Management Protocol Flowchart

Annexure A

In support of the above protocol, the following processes (which form part of the Agreement between TENET and CSIR Meraka) will also be in place to fast track interference mitigation.

a) TENET will engage with communities such as the Cape Town Wireless User Group and the Cape Town Amateur Radio Centre who operate in the coverage area and ask for their assistance in systematically monitoring television broadcasts to ensure non-interference.

b) TENET will keep CSIR well informed on the feedback from the communities and user. The feedback on possible interference will be provided within a reasonably short time, preferably as soon as feasible, and CSIR shall not be responsible where such feedback is for whatever reason delayed.

c) CSIR will, as the Licence holder, have the full authority to control the TVWS transmissions (including switching it on and off), as per the needs of spectrum measurements, or in case of interference to primary users.

d) TENET undertakes, as the operator of the Trial Network, to act speedily to bring down any TVWS transmissions about which it has become aware, whether by instruction from the CSIR or otherwise, that are causing interference to primary licensed spectrum users.

e) The interference monitoring and management protocol doesn't attempt to monitor interference and manage secondary co-users of the TV spectrum, such as RF Cable interference and wireless microphones.