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UNIVERSAL ACCESS POLICY (UAP)
STAKEHOLDERS UPDATE REPORT No. 7
UPDATE ON UAP IMPLEMENTATION

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The Telecommunications and Radiocommunications Regulator
Office of the Telecommunications and Radiocommunications Regulator (TRR)

Executive Summary

This Seventh Universal Access Policy (UAP) Update Report provides a progress update to our stakeholders and the citizens of Vanuatu on the status of implementation of the Government's UAP up to June, 2017. It builds on TRR's Sixth UAP Update Report of December 2016. This Report highlights the continued progress that has been made in respect of UAP implementation and particularly, to successfully building on to the secured industry commitment and cooperation in meeting the UAP requirements and the key Government objectives, to bring benefit to the people of Vanuatu; in accord with the intention of the UAP, as well as the economy of Vanuatu.

The Telecommunications and Radiocommunications Regulator (TRR) continues to appreciate, recognise and acknowledge the commitment of the *Players (TVL and Digicel)* and industry at large for their achievements to date, and as presented in this Report. TRR also recognises the valuable assistance, cooperation and support from the Australian Government through its Governance for Growth Program which has significantly contributed, through financial support, to its success via the deployment of telecommunications and internet access into remote and underserved areas of Vanuatu; particularly in respect of the Computer Lab and Internet Community Centres (CLICC) programs. We also recognize the support of the Japanese Government through the Asia Pacific Telecommunity (APT) towards universal access and its contribution, both financially and technically, on the Tanna (Yasur Volcano) Geohazards pilot project.

The significant milestones achieved over the last six months by the industry and the stimulus arrangements funded from the UAP Fund, have enabled TRR to make some further important additional and progressive steps towards meeting the UAP objectives.

TRR has importantly, taken a considerable proactive and guiding approach and lead role through the process of UAP implementation over the last few years; particularly in the negotiation, finalisation and signing of the UAP Player's Undertakings outlining commitments to the implementation of the UAP through the upgrading and rollout of new services, and the provisioning and deployment of equipment and materials for the UAP Information Communications Technologies (ICT) school and internet community centre programs.

The TRR is pleased to advise that, based on the current UAP deployment plans of the *Players* as well as TRR's estimated existing mobile coverage, the population coverage rollout is well on track and is expected to reach, and will potentially exceed, the overall UAP target of 98%. This means that the desired goal of at least 98% population coverage with access to broadband data services will have been achieved with industry bearing the full burden; with no cost to and no Government financial input required, which will be an excellent result all round. The first phase of the verification (Network Coverage Audit) of actual telecommunications network coverage has been completed and provides a positive indication and predictive confirmation of the UAP target being reached.

TRR has completed rollout of the CLICC, the Tablets for Students (TFS) and the Internet Community Centres (ICS) programs. Feedback received from those sites that are operational has been positive; with students and the

community being provided with basic skills training and students using the technology as part of the school curriculum. Demand for use of the sites is high, and is anticipated to increase considerably as E-government services are developed and rolled out.

The past period has seen the *Players*, Digicel Vanuatu Limited (Digicel) and Telecom Vanuatu Limited (TVL) progressing ahead with their infrastructure rollout as per their Undertaking Agreements. There have, however, been some issues for the *Players* to overcome during this last reporting period (primarily due to land ownership disputes) and this has had some impact on the infrastructure rollout; and may continue to be so into the future.

TRR has continued to undertake a Monitoring and Evaluation (M&E) role. This M&E activity is necessary for TRR to ensure that the signed Undertakings agreed to by the *Players* are delivered as per their schedule and are fully achieved.

TRR remains confident in, and is committed to, its methodology and approach to achieving the Government's UAP objectives by working collaboratively, cooperatively and constructively with the operators, stakeholders and other relevant parties and will keep the Government fully informed of all developments.

TRR will provide its next UAP Update Report in December 2017.

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1. Introduction

As part of TRR's obligation in accordance with the UAP, TRR is required to provide report to the public on the implementation of the UAP on a 6-monthly basis. Through this TRR's 7th report on UAP Implementation, we are pleased to inform our stakeholders and the public, of the significant progress made since TRR's Sixth UAP Update Report of December, 2016. This Report outlines key outcomes in the implementation of UAP that TRR has achieved over the last six months period in collaboration with the telecom industry, related Government Ministries, consumers and communities, and other stakeholders.

The past six months of the year have seen continued satisfactory progression with the UAP programs and UAP implementation. In particular, the CLICC, TFS and ICS programs have been rolled out and have commenced operation. They have been well received by educators, students and the community alike. Whilst there have been some technical issues during this period, these have been addressed under TRR's guidance and watch; with what is believed to be more appropriate solutions to the environment in which these services are provided.

Key outcomes of the last six month reporting period include:

- Continued progression of the UAP Undertaking of new sites by the industry *Players*, with a total of 8 new sites operational as at June 2017
- All TVL sites from Efate Island to Tafea Province upgraded to 3G services
- Digicel has covered the main Provincial Centres with 3G services
- Internet Broadband Satellite Coverage across Vanuatu by Kacific through wholesale arrangements with Telsat
- Continued proactive TRR monitoring and evaluation of the UAP Undertakings program
- Award of a grant request for monitoring and evaluation of the CLICC and TFS programs from a pedagogy, curriculum and community development perspective
- Technical training via Intelsat and the International Telecommunications Union (ITU) in preparation for the completion of the ITU Disaster Communications project
- Completion of coverage modelling both predictive and physical to confirm coverage obligations under the UAP undertaking agreements
- Assistance to various Ministries such as the Ministry of Education, Health, Agriculture, and NDMO providing expert advice and support to enable more effective use of the CLICC
- Continuous TRR awareness programs on the benefit of using Internet Services/CLICC sites

These are significant milestones in the multitude of steps required in the implementation of the UAP and the facilitation of internet/ICT across Vanuatu to meet the Government's objectives.

2. UAP Telecommunication Service Undertakings

TRR has continued to undertake Monitoring and Evaluation (M&E) of the *Players* UAP Undertakings; specifically the rollout of infrastructure in accordance with their agreed commitments. The M&E activity is necessary to ensure that the signed Undertakings agreed to by the *Players* are delivered as per their schedule and are fully achieved. TRR has the power and the will to apply penalties to the *Players* under the Undertakings if the obligations agreed to are not met; in all respects.

TRR, however, acknowledges all *Players* commitment and dedication through their Undertakings towards upgrading all existing sites to support 3G services and cater for future LTE services, as well as extending their services to the people of Vanuatu. It is an indication of the *Player's* support and commitment towards the Government's UAP and its implementation. It also shows that the rollout of UAP is gaining momentum, and complements the UAP's ICT school programs that are also being implemented in parallel with the *Player's* Undertakings.

It is also important to note that through Telsat's arrangement with Kacific Broadband Satellite a provider of High Throughput Satellite (HTS) services, TRR is pleased to inform its stakeholders and the public that Vanuatu has 100% of its landmass covered with Internet Broadband Access. It is now a matter for responsible Government Departments and the Business Community to contribute with connecting required communities.

2.1 UAP Player Rollout Plans

The UAP Undertakings requires *Players* to rollout infrastructure according to their individual agreement reached and signed in a commitment with TRR. Within these Undertakings, however, TRR has provided some latitude for changes and alterations to assist the *Players* in meeting their commitments, whilst providing some flexibility to the *Players* in rolling out their infrastructure in the most cost effective manner – particularly where terrain has impacted on construction, or where other issues may arise that impact on the ability to deliver but, at the same time, ensuring that the *Players* fully meet all of their obligations. The *Players* have appreciated TRR's cooperative spirit in this respect and have worked successfully with TRR towards achieving the Government's UAP goals. The Undertakings also provide TRR with the ability to levy, however, the appropriate UAP levy on a *Player*, as penalty, if a *Player* fails to meet their agreed rollout targets.

The two main *Players*, Digicel Vanuatu Limited (Digicel) and Telecom Vanuatu Limited (TVL) are continuing to progress their infrastructure rollout as per their Undertakings. Both *Players* have had numerous issues to overcome during this reporting period, and this has impacted the rollout of infrastructure. These issues can be summarized as follows:

1. Both *Players* have had significant delays to their rollout due to land ownership disputes. These disputes, whilst either now resolved or still under discussion, have significantly slowed progress on a number of specific UAP sites;
2. Extraneous land disputes impacting key network sites have also impacted progress as these activities divert focus to resolving an issue that, although impacts the UAP sites, has a greater impact on the continuance of service to a larger number of operating sites;
3. Commercial disputes with local labor whereby demands for more money and other benefits above and beyond what had been contractually agreed have continued to impede works at sites;

4. Increasingly difficult terrain requiring a significant amount of pre-work with road construction and clearing prior to civil works commencing. This has led to *Players* modifying site location in order to reduce the capital cost required for establishment;
5. Escalating costs for logistics (specifically transport and local labor) impacting Return On Investment (ROI) in marginal localities.

There is still the risk that further land and labour disputes may impact the completion of these sites by the 1st January 2018. TRR continues to undertake M&E with each player monthly to ensure compliance with the signed Undertakings and also provide flexibility as required where impacts such as land disputes or physical constraints are encountered.

2.2 Population Coverage

A key UAP requirement is to ensure provision of coverage to 98% of the population of Vanuatu following completion of the UAP Undertakings. In order to confirm that this coverage obligation has been met/will be met, TRR must measure the coverage by an industry standard scientific basis by using appropriate infrastructure information supplied by the *Players*, using recognised industry software modelling tools, undertaking physical coverage analysis, considering population data provided by the Vanuatu National Statistics Office (VSNO) and considering any updated geographical information from Department of Lands.

TRR engaged a consultancy firm, that specialises in mobile and radio communications to undertake two components of this activity. The first step was to develop a sound database of infrastructure and spectrum in use by each of the operators. This data, which comprises information on tower heights, antenna directions, power output and spectrum frequency use is the key baseline information required for modelling purposes. Following collection of that information the data, along with population and terrain data is inputted into specialized modelling software which provides an output showing the predictive coverage analysis for the sites to be 98.2% of the population covered.

A surprise outcome of this exercise was that the team noticed that the population had undertaken an urban drift with a shift away from local villages towards larger population centres. Further, these urban areas have seen increases in the population in a number of localities creating new and larger suburbs. As the model has been run using population statistics from 2009, there is a requirement to revalidate the predictive analysis based on population data collected during the 2016 mini census.

Figure 1 below shows the composite coverage post UAP tower rollout for Santo Espiritu. Composite in this case refers to the combined coverage by both Digicel and TVL. The coverage prediction shows where coverage does not exist (any area that is white) through to coverage which provides full high speed data services (areas of dark purple). Any unserved population is identified by yellow.

3. UAP Programs

The UAP programs announced during 2014 as part of an initiative between TRR, OGCIO, Ministry of Education and Training and the Australian Government under its Governance for Growth (GfG) program have substantially been completed and are now under monitoring. The programs are:

- Computer Laboratories and Internet Community Centre (CLICC)
- Tablets for Students (TFS)
- Internet Community Services (ICS)

The CLICC and TFS programs, from an infrastructure rollout perspective are complete. Likewise the ICS program is also complete. Further details are provided in the sections below.

3.1 Computer Laboratories and Internet Community Centres (CLICC)

The CLICC centres are a significant part of the UAP program with 15 schools, being provided with computer labs, for general educational purposes and for use by the community during and after school hours. The objective of the CLICC sites was to facilitate and stimulate the UAP rollout and, primarily, increase the knowledge and use of ICT within the school environment, integrate ICT into the curriculum and utilise educational materials for learning. Secondly the infrastructure has facilitated the use of the OpenVEMIS school and student management application. Thirdly, the CLICC site is open to the general community for their use to again increase and improve knowledge of ICT, increase the development of local content and provide a central hub for the delivery of eGovernment services, such as health and agriculture, into the future.

The CLICC sites have been operating for well over 18 months and continue to be well received by the student body and the community in general. Teachers have quickly integrated the CLICC into the school curriculum, at appropriate levels according to the age of the students involved. The level of demand and desire of the student body to engage and use the CLICC has been exceptional with, in some cases, students moving quickly to the CLICC room or asking teachers if they can access the room. Likewise, the interest and engagement of the community has seen many people come to the CLICC site and start to use the infrastructure.

Monitoring of the data volume has been ongoing since the implementation of the CLICC sites, and is shown in Figure 2 below:

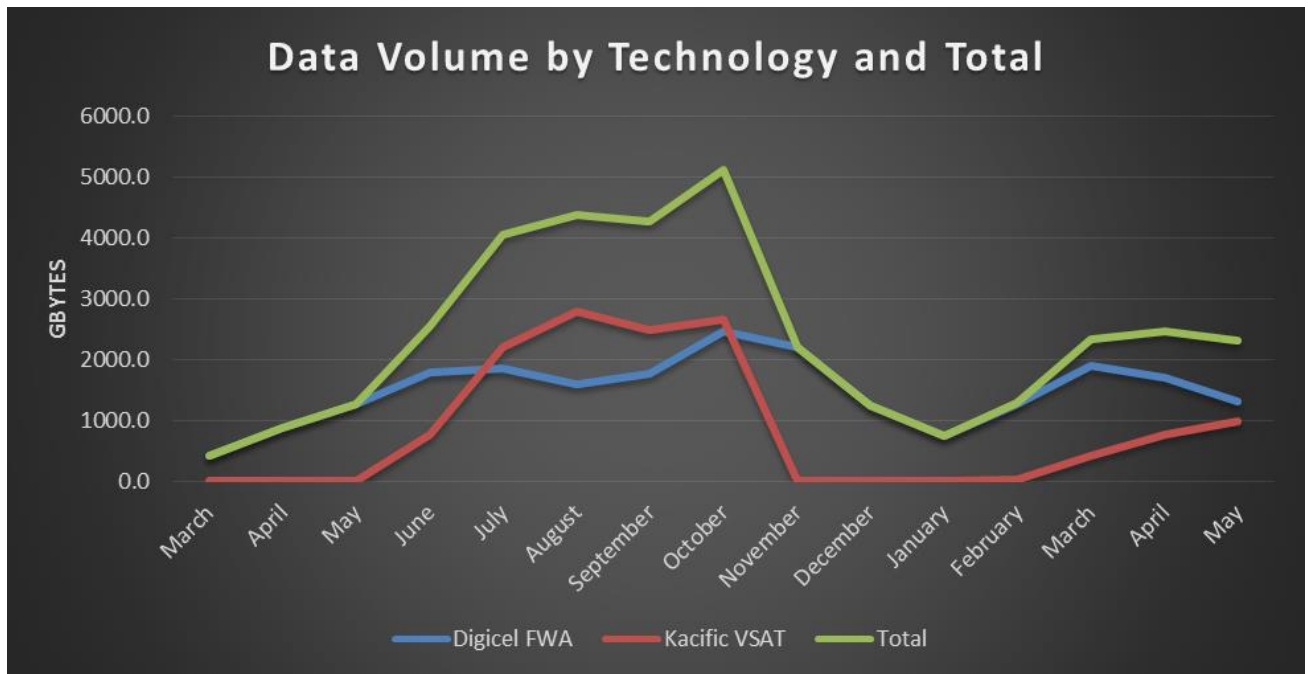


Figure 2 CLICC/TFS Data Volumes

The graph clearly shows the dip associated with the summer school holidays, however the CLICC sites were still used by the community. As school recommenced, the data volume subsequently rose. It should also be noted that the Kacific VSAT solution underwent a major change leading to a lengthy outage at the VSAT sites. This change required new equipment and a re-point of the VSAT dish at each site, compounding the outage. All sites are now operational.

Figure 3 below shows the data volume consumed from March to May 2017 at each individual school. Generally, the larger schools (by student cohort) are the greatest consumer of data. Again the data clearly shows the summer holidays and the Kacific outage, as well as the increase once school commenced for the 2017 year. Interesting the consumption is lower than previously which may mean that the novelty of access has worn off and the CLICC site at that school is now running in a more “as usual” fashion.

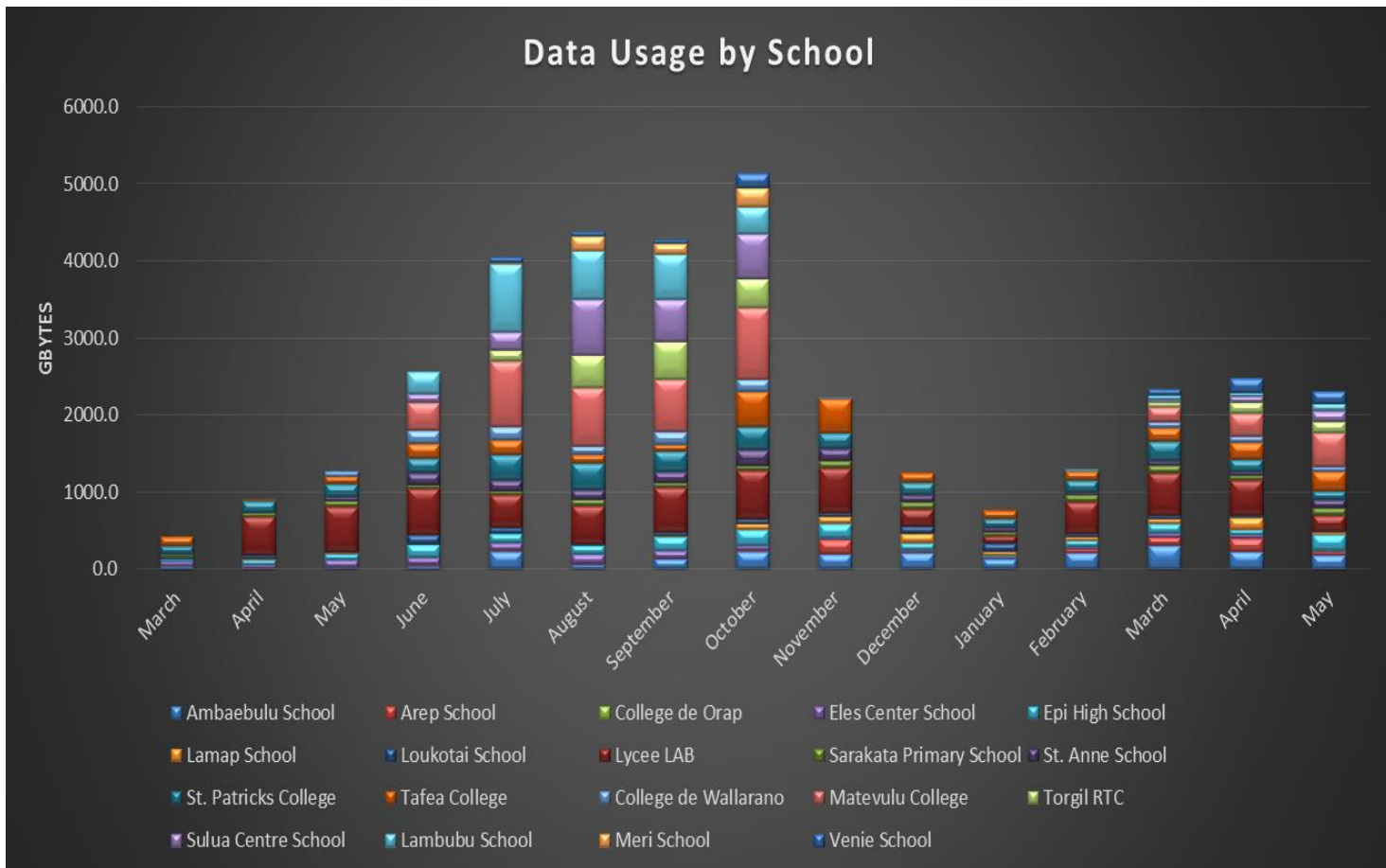


Figure 3 Data Volumes for Schools

3.2 Tablets for Students

All TFS program schools have had delivered their complement of fifty tablets (with appropriate educational applications for evaluation).

3.3 Internet Community Services

The ICS program is now complete and the TRR is concerned only with the general monitoring of the operations. Across all sites there is a strong demand for more government services to be available online for the local communities to access. Of the three (3) sites in operation, Ituani Informesen & Communikesen Senta, Malo has progressed the furthest being proactive in engaging the community in training and provision of services to the community.

Nali Enterprises in Ambrym, although operational, is facing significant issues with inconsistent supply of an internet serviceprovider. The combination of the remoteness, poor power infrastructure and high cost to serve, has seen the site operate without internet for significant periods of time which impacts the community use of the ICS. An alternative solution, identical to that in service at remote CLICC and TFS sites is now commercially available across Vanuatu, has been suggested to the operator to eliminate the issues associated with connection to the network edge.

3.4 Monitoring and Evaluation

M&E is now a critical and essential step in the UAP rollout. Whilst it is embedded into the UAP agreements and is currently being undertaken by TRR on a monthly basis, M&E associated with the CLICC and TFS sites is required. At present, TRR has applied for a research grant through the GfG to undertake this M&E task. Following (the expected) approval of the research grant, TRR will progress, in concert with OGCIO and Ministry of Education and Training (MoET), to open market competition to select an appropriate party to undertake the M&E research activity.

As a precursor to this activity, TRR has undertaken an informal survey of the CLICC sites to gauge the general consensus of use of the sites. This informal survey was responded to by 10 sites and considered a number of areas and have been summarized below.

1. **Accessibility:** The CLICC sites are open and available to the community and the general public. In particular, general public users have included; students and teachers from surrounding schools, employees from government, seasonal workers (both outgoing and returned), non-governmental organizations' (NGO), local business operators, various faith based organizations' and health outreach clinics.
2. **Changes resulting from the establishment of the facility:** The analysis here is qualitative in nature, however the overall response has been one of a significant positive change. Firstly schools have reported that there has been a relative increase in students receiving improved grades and an increase in students continuing on to higher academic years; teachers feel less isolated with access to the technology and the availability of further improvement via online courses and communication with the department has improved.

Secondly, within the community school leavers now have access to higher education without the need to leave the community due to the expense of doing so. The general community has seen improvement in basic ICT skills such as the use of computers, application training on word, excel and the basic social media skills contributing to their ability to access and obtain information which leads to further demand for service provision.

However, the negative impacts also need to be noted so that these can be addressed in the future such as the access to restricted content. Thus basic skills for using the internet are required in order to ensure safe use as well as inclusion in the digital society.

3. **Sustainability:** The ongoing cost of service provision, in particular internet access, is a critical factor for ongoing operations of these sites. Whilst the individual sites are charging for usage and for other peripheral activities this is unlikely to cover the entire service fee. There is a need to look at cost sharing at the school sites with government is an essential activity.

4. Areas of Improvement: There are two key areas that need consideration moving forward. The first is the provision of service from service providers both internet and computing support. Whilst it is understandable that support will be difficult in remote areas, the evidenced lack of support by providers in this case is an issue that will impact on further development of the local economy. There is a need for skilled ICT workers to be developed in these areas in order to support the infrastructure in the area, this includes both solutions such as CLICC as well as that in place with operators. By developing this skill set, the time to repair can be reduced (which is an important issue in business) and more significantly the cost to repair will decrease (logistics of travel is the biggest contributor and hindrance to support).

Secondly, ICT infrastructure requires power and power is a limiting factor in the development of economies outside metropolitan areas. Further development of CLICC sites, or any other major ICT infrastructure requires the procurement of power solutions to meet the need. This is a significant extra cost that will need to be budgeted for as it is unlikely that grid power will reach many areas of Vanuatu in the medium term time horizon.

5. General Comments: The CLICC sites provided general comments on the infrastructure and some of these are provided below;

“Year 8 students were able to use the internet last year to study for end of year exams and further grasp concepts in all different areas that their teachers couldn’t explain. This led to students at Sulua scoring higher marks on their exams than any other school on the island”

“It facilitates the administration work concerning all the documents coming from the ministry or other departments. Before we have to go to Norsup or to Lakatoro, but now with the CLICC we just stay at school and receive through email and sent back like this evaluation of CLICC. So the CLICC reduces the cost”

3.5 Training

Prior to handing over of the CLICC/TFS sites by December 2017, TRR is conducting a training which will be in twofold. The first is technical training on the infrastructure in place at the sites and how to support that infrastructure in the short to medium term. This will ensure that all CLICC/TFS sites and MoET representatives have been retrained prior to handover of the sites. Secondly further hands on ICT training for the local community considering basic ICT, application and social media training will be provided were this is appropriate.

3.6 APT-J3 Tanna Volcano Monitoring Project

The team from the Japan Telecommunications and Engineering Consultancy Service (JTEC) revisited the APT-J3 Volcano Monitoring project to rectify failures of the cameras at two (2) sites. The visit replaced the camera located on Hill 552 with a more sustainable high definition camera due to failure of the thermal imaging camera at that site. The second camera at Ienula School operates satisfactorily during daylight hours but due to limited battery capacity after sundown shutdown rendering the thermal

imaging camera inoperative during nighttime hours. Rectification of the power network at Laneula School. This network provides for 2 cameras to monitor the activity of Mt Yasur on a 24 hour basis with the video transmitted back to the Vanuatu Meteorological and Geohazards Department (VMGD) in Port Vila. All images are collected and stored on a video server, provided by JTEC as part of the solution, for later analysis and display to the public by the VMGD website.

3.7 ITU Emergency and Community Centre

As part of the recent ICT Days, training on the installation and operation of these systems provided by the International Telecommunications Union (ITU) was conducted by a training representative of Intelsat. This training was a combination of online, classroom and practicum and was presented to various representatives of Pacific Island States involved in the ITU project.

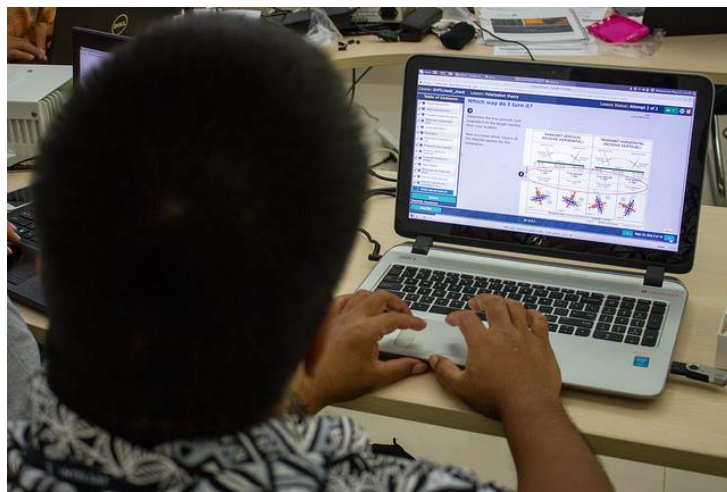


Figure 4 VSAT Training Online Exercises

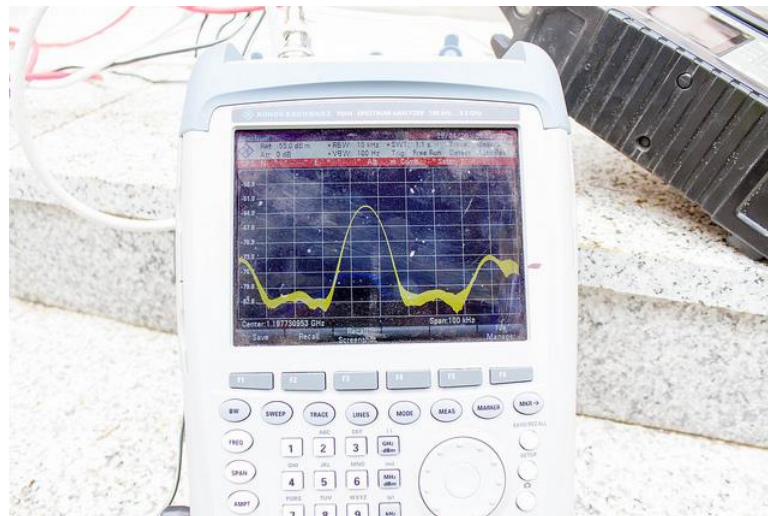


Figure 5 Identification of Satellite Signal



Figure 6 VSAT Installation Practicum

The training identified a number of issues with the infrastructure supplied by ITU which will impact on the implementation and operation of the associated service. With respect to Vanuatu, a number of issues were identified with incorrect equipment being provisioned. TRR is now awaiting the response from the ITU on these issues raised; prior to shipping the infrastructure to site.

4. Reporting

TRR will continue to provide report to its stakeholder and the public at 6 monthly intervals. TRR's next scheduled Report will be provided in December 2017. That report will be the final report covering the UAP projects and under the UAP.