Altech UEC (Pty) Limited.

Submission on

the South African

Digital Terrestrial Television Standards

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1   Purpose

This document is written in response to Ms Mamodupi Mohlala, the Director General (DG) of the Department of Communications (DoC), request for written submissions. This request was made during the closing remarks of the SADC digital terrestrial television (DTT) standards symposium held at Gallagher Estate on Friday 30 April 2010.

The document provides a high level outline of Altech UEC (Pty) Limited's (Altech UEC's) view with regard to the DTT standards currently under review in South Africa. The document is not intended to be an exhaustive response, but rather provides a number of succinct straw man principle arguments which promote maintaining the status quo of the adopted digital video broadcasting - terrestrial (DVB-T) standard within South Africa.

The document makes reference to a series of meetings between the DoC and Altech UEC over the past 3 years. To remain succinct, a few key items are outlined with reference to the source material should a detailed account be required.

This document is confidential between Altech UEC (Pty) Limited and the Department of Communications

2   Reference

The non exhaustive list below details some of the written submissions from Altech UEC to the DoC with respect to broadcast digital migration (BDM). These documents explain how BDM may be utilised to grow South African intellectual property (IP) and drive information and communication technology (ICT) sector growth.

(Please note this list does not include minutes of meetings, tours of facilities, discussions and email correspondence).

- 04 April 2007 – Response to draft broadcasting digital migration strategy for South Africa

- 01 October 2007 – Letter to Director General

- 03 December 2007 - Letter to Director General

- 09 January 2008 – Letter to Themba Phiri

- 29 May 2008 - Draft ICT growth strategy

- 17 November 2008 - Response to Draft Broadcasting Digital Migration Framework Regulations

- 25 May 2009 – Letter to Minister

- 03 August 2009 – Letter to Minister

- 25 August 2009 – Letter to Keith Shongwe

- 27 October 2009 – Letter to Gift Buthelezi

3   Introduction

This document encapsulates the comments and views of Altech UEC (Pty) Limited, (Altech UEC). The document draws upon the knowledge and experience of Altech UEC as the only South African company to design, develop and produce hardware and software solutions for the international digital television and interactive television industry.

Altech UEC's response encompasses over 15 years of direct experience as a pioneer of the digital video broadcasting set top box (STB) industry. Comments have been obtained by canvassing input from over 150 qualified electronic and software engineers and technicians within our staff compliment.

Altech UEC felt compelled to respond directly to highlight the intellectual property that exists and has been developed by South African companies which could be utilised within the broadcast digital migration (BDM) programme and drive ICT sector growth for South Africa. This submission reflects Altech UEC's willingness to contribute towards the digital migration program and grow the local ICT sector by harnessing and developing local capability.

While Altech UEC has extensive DVB experience, we are technology neutral and, despite our DVB-T investment to date, are able to adapt to future requirements. As a loyal South African company we stand ready to support the DoC in promoting local IP and ICT sector growth with its decision on DTT standards.

4   Executive summary

Tests show that integrated service digital broadcast – terrestrial's (ISDB-T's) technical performance is broadly similar to that of DVB-T. There is no compelling technical reason to adopt an alternate standard. ISDB-T however comes with a significant risk profile, namely:

- ISDB-T has never been deployed or developed on 8Mhz

- No ISDB-T skills exist in South Africa, they are rare and will need to be imported

- No South African intellectual property exists based on ISDB-T. All ISDB-T intellectual property will need to be procured off-shore.

As a technology company, Altech UEC is able to rapidly understand and adopt any technology in the broadcast set top box space inclusive of associated middleware and as such Altech UEC is technology "neutral". The more proprietary and complex the technology the more able Altech UEC is to differentiate and add value.

The key consideration for a technology house is that of return on investment (ROI). Is the market segment being addressed significantly large enough to enable one to recoup the investment? Over the past 15 years Altech UEC has invested in DVB generically as a standard (DVB – S / C / T). More specifically, based upon South Africa adopting the DVB-T standard Altech UEC has invested significantly in the development of local intellectual property (IP) (hardware and software) to support the government led initiative and aspiration of promoting local IP, ICT sector growth and transformation. The adoption of DVB-T in over 120 countries and South African government commitment to link e-government services with digital terrestrial television provides sufficient market to enable South African companies to innovate and recoup their investment in multiple markets. Due to the uniqueness of 8 Mhz channel requirements for ISDB-T in the ITU region 1 (Africa and Europe) it is imperative that the DTT standard adopted for South Africa be aligned with the broader African market. The South African television market is not large enough to warrant more than one entrant should the technology not be exportable to other markets.

Over the past 15 years, Altech UEC has generated in excess of R8Bn rand of income and manufactured circa 10m STBs of which circa 50% has been export revenue. In summary; Altech UEC has been successful in the development of local IP, adopting open standards to service and innovate in their home market and then exporting this same IP and knowledge into other markets.

A significant delay in DTT, apart from retarding liberalisation of the broadcast sector will result in delays in releasing the digital dividend. This in turn will impact South Africa's telecommunication strategy – that of increased competition, affordable bandwidth, greater internet uptake and hence ICT sector growth which is all linked to increase in GDP. The delay in DTT launch will result in a delay in analogue switch-off which ultimately will result in a delay in the release of spectrum. The retardation to the South African telecommunication strategy is perhaps the biggest threat to ICT sector growth.

Whilst the private sector will argue for DVB-T based upon risk and cost; the South African government focus is on socio-economic upliftment. Within the context of bilateral trade agreements the Japanese and Brazilian government's promotion of ISDB-T as a standard is appealing. DVB-T, originally a European standard is not being promoted by the European Union. It is Altech UEC contention that the adoption of ISDB-T will further the interest of those companies with technology in Japan (hardware) and Brazil (software) whilst providing little to no benefit to South African companies.

Brazil commenced their DTT development of the ISDB-T standard based on MPEG4 technology in 2006. There is significant benefit to Brazil in terms of export and licencing of their IP should South Africa adopt ISDB-T. The more aggressive the timeline to migrate, the greater the requirement to import working solutions. Yes, this import will be coupled with the development of training facilities in South Africa and perhaps the manufacture of some STBs locally. However issues of sustainability and creation of local IP that will lead to ICT sector growth and exports will not be achieved by the adoption of ISDB-T. To the contrary, there is IP that currently resides and is vested in South Africa. Altech UEC has since 2007 argued for a controlled deployment model which leverages South African IP.

Altech UEC continues to offer its assistance to government and other South African companies to assist ICT sector growth and to drive transformation within the technology and digital broadcast sector. The very same points raised by the Japanese and Brazilian delegations for the adoption of their standards has been made by Altech UEC since the inception of the BDM process. The single difference in argument is that Altech UEC's proposal is focussed on growing the local ICT sector and utilising local IP to the benefit of all South Africans.

5 Consideration for changing the broadcast digital standards

This section provides straw man arguments outlining key principles to not change the broadcast digital technical standards

5.1 Ground zero plus five years: Background to DVB-T

Considering that:

In 2005, South Africa selected DVB-T as the standard for digital terrestrial television (DTT) – (SABS 300744:2005). Significant progress has been made based on the decision to adopt and implement the DVB-T standard:

- June 2006 - South Africa becomes signatory to the ITU Geneva 06 regional agreement (DVB-T standard adopted)

- November 2006 – Digital Migration working group recommends the adoption of DVB-T after reviewing all standards

- September 2008 – Minister of Communications published the Broadcast Digital Migration Policy for South Africa which confirms the adoption of DVB-T

- October 2008 – ICASA grants trial broadcast licences to SABC and M-Net based on DVB-T standard.

- November 2008 – Trial broadcast commence with Altech UEC supplying STBs. Altech UEC commence development of Altech UEC RED – Linux based middleware inclusive of MHEG5 stack to support South African DTT standards and in particular e-government services.

- July 2009 – SABS publish SANS 862:2009 – the standard for free-to-air digital terrestrial television set-top boxes

- August 2009 – SADC regional broadcasting digital migration working forum resolve to use GE-06 as the basis for planning migration, adopt DVB-T as the standard with provision to enable countries to upgrade to DVB-T2.

- November 2009 – ICASA publish the final frequency plan based on DVB-T.

In addition, numerous African countries have adopted the DVB-T standard, commenced broadcasting the digital signal and launched digital services - examples include: Namibia, Mauritius, Tanzania.

Therefore:

There is no reason to revisit the matter of technical standards for BDM and no compelling reason has been provided. Any change now is likely to result in a 3 to 5 year delay in the process based on experience to date. As a minimum the following would be required:

- New STB specifications

- New broadcaster rules of operation and middleware specifications

- Additional frequency planning and co-ordination

- ITU work required to ensure defined standard for 8MHz ISDB-T and no interference in region 1.

A change to ISDB-T will result in fragmented broadcasting standard in Africa which is not good for the consumer, broadcaster, the private sector or the continent as a whole.

5.2   Technology house neutral

Considering that:

Altech UEC has been developing a range of STBs for the past 15 years, working with companies from multiple countries on all continents. As an example, Altech UEC has forged relationships with European, Japanese and Chinese companies and delivered successful projects based on European, Japanese and Chinese technologies[1]. Whilst we have predominantly worked in the DVB space; Altech UEC is capable of adopting, integrating and innovating with any technology. The more complex the project, the more proprietary the standard; the more Altech UEC is able to add value and differentiate through the development of product and services.

The key concern for a technology house is that of total addressable market (TAM), economies of scale and the ability to achieve a suitable return on investment.

For the non-technical person, ISDB-T and DVB-T seem to offer comparable functionality and capability. However a transition to ISDB-T holds considerable risk and comes at a significant cost to the tax payer.

1. ISDB-T never been deployed in 8 MHz

    Whilst ISDB-T has been deployed in Japan (MPEG2, 6 MHz) and in Brazil (MPEG4, 7 MHz), it has never been deployed anywhere on 8 MHz. The ISDB-T deployment in LATAM is significantly different than that of Japan and it is generally accepted that the Brazilians built their ISDB-T standard from the ground up.

    Economies of scale (directly related to input costs) is the key driver of cost. Newer technology with fewer adopter will necessitate a higher price. Should South Africa select ISDB-T, this will be a virgin deployment of this technology in 8 Mhz within a relatively small market necessitating increased cost to industry and the tax payer.

2. No ISDB-T skills in South Africa

    Hundreds of millions of rands have been spent by broadcasters, signal distributors and manufacturers in South Africa on DVB-T equipment. Apart from the wasted investment in DVB-T equipment, the skills that reside in the country will need to be re-purposed at significant cost exacerbating the time delay to migrate to digital

    The pressure to migrate within the deadlines decided by the South African government will result in the import of skills and expertise from Japan and Brazil with the pledge of skills transfer It is evident that this would be of benefit to the Brazilian and the Japanese private sector. Little to no focus is on the direct benefits to the South African economy apart from additional cost.

    Over the past 15 years, Altech UEC has accumulated significant digital broadcasting and DVB expertise. Over the past 3 years we have invested in DVB-T. Altech UEC along with

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[1] Altech UEC partnership success extend beyond relationships with European, Japanese and Chinese entities.

other industry partners are ready to launch DTT services based upon nationally agreed and published standards.

Drawing on our experience, a change in specification at this time will result in significant delay to the BDM programme. Apart from the lengthy process and procedures required to instantiate a change in standard, a technology project of this nature typically takes longer than one expects.

3. No South African intellectual property

As outlined above, the deadline set by cabinet to migrate to digital by 1 November 2011 and government's SADC commitment to migrate by 2013 (if achievable at all) will result in South Africa licencing and importing technologies and solutions from Brazil and Japan with little or no opportunity for local innovation.

Whilst much energy has been consumed focusing on the difference between specification royalty and implementation royalty of software (the reader should read section 5.3 - the fallacious royalty argument - below for more detail); it is fact that South African companies wanting to participate in digital migration will be required to licence Ginga middleware stacks from one of only a handful of software companies in the world.

Altech UEC has developed its own MHEG and Linux based middleware stack as part of the DTT DVB-T trials that took place in South Africa. Altech UEC has repeatedly committed to government that we would look to share this technology with South African companies and / or the South African government on a internationally competitive commercial basis (similar to that proposed by the Brazilian government). The middleware is the key technology element that will enable e-government services and lead to ICT sector growth. The Altech UEC middleware has been built on open standards with a defined application programming interface (API) / software development kit (SDK) to enable third party software houses to leveraged their skills and relationships to develop value added service applications for government services. The core to growing local IP is to ensure that the middleware is South African owned and innovated to enable other South African companies to develop extensions and innovate on top of a South African owned IP.

The investment required to instantiate a software entity is significantly lower than the capital required to develop a manufacturing entity.

Apart from this, Altech UEC has committed to licence it's hardware and software designs to local manufacturers as well as subcontract a portion of allocated volumes.

Altech UEC has been engaged with NAMEC, e-Mpumalanga Connect Consortium AMAP Holdings, Tedelex, Mayibuye Consortium and Sabretek among others.

The DoC's stated objective is to create policies that encourage innovation and the development of local IP. ISDB-T is being considered due to its success in creating Brazilian IP. It is ironic that the DoC has not engaged with local companies to understand the IP they have and to understand the local IP that could be made available to the country. Altech UEC has written to the DoC on numerous occasions to facilitate such discussions but have been unable to secure meetings. Altech UEC middleware facilitates the transfer of digital content to and from the home via 3G / GPRS modem or usb memory stick. At the Commonwealth Telecommunication Organisation's February 2009 annual digital switch over forum – sponsored by the DoC, Altech UEC demonstrated a web browser, email and digital content transfer running off the SANS862:2009 conformant STB. A further presentation was made at 5th annual digital switch over forum in April 2010.

In summary: Altech UEC has been unable to secure an audience with the DoC to demonstrate the middleware capability in more detail. It would appear that only foreign entities are able to be granted a national podium to present foreign IP.

5.3 The fallacious royalty argument

Much energy has been consumed focusing on the difference between:

- specification royalty – royalty required to be paid should a technology house build a software utilising the defined specification

- implementation royalty – royalty required to be paid when utilising the particular software development / implementation

It has been argued that unlike MHP, Ginga is free. That is, it does not require the payment of a specification royalty. Whilst South Africa has selected MHEG5, a specification standard that is royalty free; it will be argued that Ginga is a far superior middleware to MHEG5.

This has been a rather complex discussion to understand. The simple fact about royalties is that when someone procures a software stack from a 3rd party, the 3rd party is responsible for paying any royalties that may be due (such as the specification royalty). Hence one need not focus on the cost of the specification royalty but rather the cost of the implementation royalty. The key questions are:

- Will the Ginga implementation middleware be cheaper (by USD $1.75 as stated by the Brazilian delegation) than MHP?

- What is the price delta between a between Ginga and MHEG5 middleware? The royalty for MHEG5 implementation software runs from USD $1.50 to USD $0.45.

- Apart from the implementation royalty cost, what is the cost to modify the software and the cost of ongoing support for the software?

Since the IP for the Ginga stack resides outside of South Africa, any changes required to the middleware or support of the middleware will require the foreign 3rd party to make the required changes. South African DTT will be locked into foreign IP and reliant on foreign companies to make the changes to the middleware and / or standard. Foreign companies focussed on commercial profit will respond to changes that service their market interests. The particular requirements of the South African market place may not be desirable. Utilisation of foreign IP stifles innovation as no local company will be able to develop functionality directly in response to market demand. With no capability, no energy will be focussed on developing unique solution to service our market realities.

Altech UEC's middleware is specification royalty free and has been designed to specifically service the South African market in line with the broadcast digital migration policy.

5.4 The social-economic argument

The private sector will argue for DVB-T based upon risk and cost; the South African government focus is on socio-economic upliftment. Within the context of bilateral trade agreements the Japanese and Brazilian governments promotion of ISDB-T as a standard is appealing. However, it is Altech UEC's contention, (as outlined in detail in the letters dated 3 December 2007 and 9 January 2008 to the DG and Themba Phiri respectively), that only a controlled DTT deployment model leveraging South African IP will result in ICT sector growth for South Africa

A controlled deployment of STBs for the digital migration program would stimulate the local economy and give rise to a wide range of opportunities from technology development (e.g. interactive business solutions) to consumer premises services (e.g. installation SMME's). Further, a controlled platform deployed and designed in South Africa is a strong candidate as a technology platform for export into Africa. In order to support this model, government would need to mandate an STB specification which includes provision for conditional access and interactive software standard. Local partners would then be selected to deliver and manage this digital platform. Local value add would result in excess of R3Bn in terms of hardware, software and services revenue for the country.

Altech UEC have innovated with a number of world firsts as detailed in our numerous submission to the DoC. All IP is developed and vests within a South African company. Altech UEC holds a number of patents and more specifically we have created a vision and developed product and patents to support governments vision for universal access and e-government services.

Altech UEC have in the past and continue to outsource manufacture of sub components and whole STBs to scale production to meet demand. In addition, Altech UEC procure metals, packaging and accessories from local companies.

Within the framework of DTT, Altech UEC have committed to:

- Licencing their hardware and software IP to other South African companies wanting to participate in DTT

- subcontracting elements of the manufacture of subsidised units

- maximising the participation of local companies in the supply chain

- developing SMME in terms of after sales support, installation and distribution

The Altech UEC business methodology has proven that we are able to innovate and develop local STB IP (hardware and software) to address our local market conditions and then to leverage that IP into international markets. To date Altech UEC has generated R4Bn of revenue from exports relating to some 4.4m STB units and generated R4Bn of revenue from 4.8m STB units consumed within the local market.

South Africa should look inwards to establish what we can achieve at home before we look to adopt / import foreign IP. South Africa should ape what the Brazilians have done in terms of defining a South African standard and then creating and promoting local IP for the benefit of South Africa and the African content. This must be achieved in harmony with ITU GE-06 with the aim to harmonise and unify the African continent on a single standard.

The adoption of ISDB-T will result in a net import situation with regard to use of Brazilian and Japanese IP and product and be to the detriment of the skills that currently exist in South Africa.

Foreign companies do not invest nor subscribe to the BBBEE codes of good conduct and government should be cognisant of the commitment and contribution local companies make to South Africa.

Beyond the contribution to the growth of the local ICT sector, the recent Financial Mail / Empowerdex Top Empowered Companies in South Africa for 201 survey has shown that Altech is rated:

- the 7th top empowered company in ICT sector

- number 6 of the top corporation that procures from black owned and empowered companies which makes Altech 3rd top ICT company in this regard

Altech UEC BBBEE transaction is close to completion and will include women, prominent business people and be broad based to include those from previously disadvantaged communities.

5.5   Local protectionism or ISDB-T leads to ICT sector growth?

It has been argued by the Brazilian delegation that the adoption of a variant of the ISDB-T (7 MHz) using MPEG-4 compression algorithms necessitated the development / modification of the Japanese ISDB-T standard (6 MHz MPEG-2). This resulted in close co-operation between the Brazilian government, local universities and the private sector to innovate and build the required technologies for DTT locally - the Ginga middleware being one of the key outputs of this decision.

Altech UEC has supplied significant personal video recorder STBs to Sky Brazil and Sky Mexico. Altech UEC can advise that Brazil has the highest duties imposed on imported STBs. With a 20% import duty and further municipal and local taxes being applied to STB products manufactured outside the free trade zone of Manaus, resulting in a surcharge in excess of 50% on STBs entering Brazil. This fact in itself necessitates the manufacture of STB and digital televisions within the borders of Brazil. Add to this the requirement of new software to manage the MPEG-4 compression and ICT growth is a natural outcome.

6   BDM & the ISAD programme

The broadcast digital migration programme within an emerging market context (in particular Africa) should be viewed as more than a broadcast initiative within the television domain. It should rather be viewed as an infrastructure programme within the broader ICT sector. DTT deployed as a controlled infrastructure will digitise the home. In the African context this provides citizens with access to information beyond digital television and should be a key initiative within the ISAD (information society and development (ISAD)) programme.

At the 5th annual digital switchover forum of the Commonwealth Telecommunication Organisation, Altech UEC delivered a paper outlining how DTT addresses the following pillars of the ISAD plan namely:

- Pillar 2: ICT infrastructure and universal access

- Pillar 3: local content

- Pillar 6: ICT capacity development and R&D

The Altech UEC middleware, Epsilon software generation toolkit and MediaGate digital content transfer are all examples of South African IP which specifically promote these pillars. Altech UEC would welcome the opportunity to engage with government on how all South African companies could benefit from the adoption of a South African standard leveraging off past investment based on South African capability.

7   About Altech UEC

Altech UEC is a leading developer of hardware and software solutions for the international digital television industry. Altech UEC specialises in the provision of integrated solutions comprising high-specification, high quality products supported by value added software solutions and logistical support services. Altech UEC has a global reach with technical development and support centres in South Africa and Australia and sales support offices in South Africa, Australia, India and Israel. Altech UEC boasts a blue-chip client base and an award winning product portfolio as well as an enviable reputation amongst its partners and peers as one of the most technologically capable businesses in the industry.

Altech UEC is a pioneer of the digital video broadcast STB industry having launched a world-first digital video broadcast STB in 1995 and continues to lead the industry through the development of ground-breaking products custom designed to suit each Network Operator's unique technical and commercial requirements. Since that time, Altech UEC has consistently been in the forefront of digital technical innovation, enabling it to capture market share around the world

Today, Altech UEC is focused on the design, development and manufacture of compressed digital television and data reception equipment for satellite, terrestrial and cable television Operators, and in the design and development of interactive television applications. Altech UEC employs approximately 1000 people worldwide including over 150 qualified electronic and software engineers and technicians.

Altech UEC's reputation as one of the world's leading R&D facilities in its chosen field has led to several significant joint venture, technology transfer and collaborative projects with major international manufacturers. Altech UEC's own intellectual property forms the basis of all Altech UEC's products and market leading middleware and conditional access systems are incorporated against third-party license agreements. In addition, Altech UEC's commitment to quality has made the Altech UEC product a sought after commodity throughout the world.

The company, whilst being technology conscious, is market driven and all Altech UEC products are developed with a specific market or application in mind, often in partnership with its operator clients. Specializing to this extent has resulted in Altech UEC acquiring the skills, knowledge and ability to translate its customer's requirements or concepts into a finished product in the shortest possible time.

Altech UEC has developed and deployed digital terrestrial decoders which utilise an integrated multi-standard MPEG-2 & MPEG-4 (H.264) Standard Definition processor. In addition, Altech UEC has developed its own middleware stack based on open standards. The Altech UEC middleware is Linux based and supports the MHEG5 requirements as outlined in SANS862:2009. This middleware has been specifically developed to support e-government services and universal access to internet as requested by government and outlined in the broadcast digital migration (BDM) policy for South Africa published in September 2008. Altech UEC is the primary provider of STBs to the South African Pay-TV market.

Altech UEC believes that they are unique in being a local company with broad international experience in the manufacture of digital STBs. In addition, Altech UEC employs over 1000 people and is an active participant in corporate social investment and broad based black economic empowerment initiatives.