Satellite Industry Initiatives

TERMINAL QUALITY, CYBER-SECURITY & HA/DR

GLOBAL VSAT FORUM
ITU BANGKOK SATELLITE SYMPOSIUM
31AUGUST- 1 SEPTEMBER 2017

INTRODUCING THE GVF ….

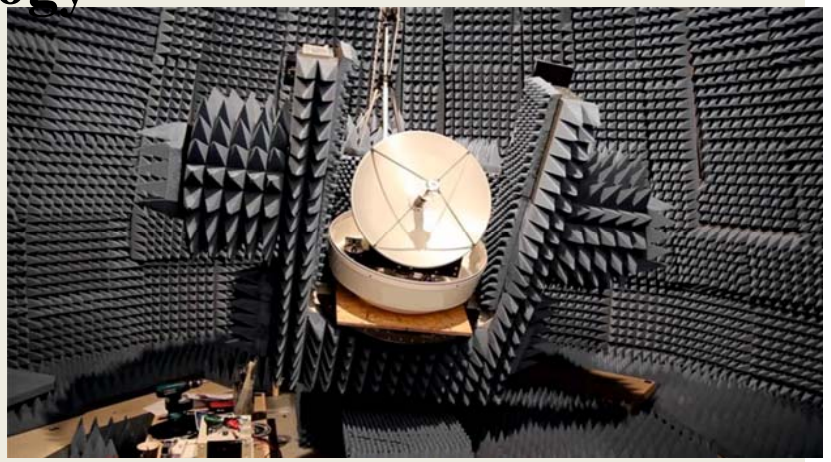
- GVF is the global non-profit association of the satellite industry
- 230 member companies
- All of the world's major satellite bandwidth suppliers and satellite equipment manufacturers
- Many local and international connectivity providers
- Collectively these companies and their contractors supply, install, maintain and operate >1 million stations throughout the world

Dr Bob Horton

Consultant to GVF

GVF Product Quality Assurance

- ✓ **Minimum Antenna Performance Specifications Announced (SOMAP)**
- ✓ **Harmonised Spec-Sheet Terminology**
- ✓ **GVF 101 - 105 ***
- ✓ **Authorised Test Entities**
- ✓ **Test Range Validation**
- ✓ **Terminal Testing**



GVF ATE: Fraunhofer IIS

* https://gvf.org/approvals/gvf-mra-documentation.html

NEXT STEPS

- Implementing global test program now
- Addresses fixed and mobile antennas
- All primary frequencies (C, X, Ku, Ka)
- “SOMAP Compliance” In Effect – Mfrs to comply by 1 September 2018
- Any additional test requirements (e.g. from operator, regulators, etc.)
- Helping to promote approved products, minimise interference, improve quality!

CYBER-SECURITY

- Formation of Cyber-Security Task Force
- Establishment of Best-Practice Guidance
- Outreach Underway to…
  - National Administrations
  - Users
  - Industry

THE GVF CYBER-SECURITY POLICY GUIDELINE

- SHARE WITH APAC GOVERNMENTS, INDUSTRY, END-USERS

- JOINT STATEMENT HANDOUT – FROM SIA/GVF (SEE ME)

Created by the members of the GVF task force with counterpart group at Satellite Industry Association

Representation from vendors, network operators, end-users of VSAT (FSS/MSS)

Details steps being taken by satellite industry

Focus on how industry can work collaboratively with government

THE CYBER-SECURITY GUIDELINE: CORE PRINCIPLES

Voluntary, industry-led efforts and public private partnerships are the optimal way to address cybersecurity at the national or international levels.

Satellite industry organizations should actively address cybersecurity using industry best practices for risk management.

Robust cybersecurity is aided by voluntary information sharing, free from fear of adverse consequences.

IN CONCLUSION: THIS ISN'T GOING AWAY.

Security scrutiny of the satellite industry is higher than it's ever been.

Exploitation of systems is widely discussed, and we should assume the bad guys are paying attention too – and using that knowledge maliciously.

GVF Security Task Force – a coordination center for satellite security knowledge

Vendors and network operators should implement robust protection, abandon widely discredited practices where they still exist.

HUMANITARIAN AND DISASTER RELIEF

- GVF main entry point : Certification Program
  - Building skills
  - Rapid identification of local certified personnel who can assist in disaster relief efforts

UN CRISIS CONNECTIVITY CHARTER

- The brutal calculus of costs : financial and human
- Mitigation through the joint efforts of :
  - United Nations' Aid Agencies
  - NGOs
  - Host nations
  - Military
  - Private Sector

THE CHALLENGE OF PRE-POSITIONING

- Has severely hampered public and private efforts for ICT solutions that are local to the disaster zone and can be quickly applied
- A key is to link the same pre-positioned systems so that they are not only used for disaster response but can be repurposed to achieve medium- and long-term objectives at a satisfactory level

A FIRST PHASE : *A GVF DISASTER PREPAREDNESS REGISTRY*

- GVF proposes to invite all GVF Members to voluntarily identify their systems, services and other resources that :
  - Are currently operational
  - Can be re-purposed for use if/when necessary to support disaster-relief efforts
- Inherent to the Value Chain
  - Their location (as closely as possible), and
  - Contact details

…. WHEN A DISASTER OCCURS ….

- UN, NGO and government disaster – response stakeholders are able to access the GVF Registry for free
- Identify systems and services available locally to help support disaster-response efforts
- Terms and conditions are subject to agreement between then responder and the supplier
- Solutions available from members potentially include :
  - Fixed and mobile satellite-based solutions
  - In tandem terrestrial systems eg. GSM, WiFi, WiMAX, fibre optic cable, pico and femto cells etc.

CRISIS CONNECTIVITY CHARTER

- **A PARTNERSHIP:**

- **WHY:** Increase in number & impact of crises around the world – natural & unique ability of satellite solutions to help

- **BENEFITS**: More effective & efficient private sector contribution / predictability / tool with which to garner further support & raise awareness in the global community

GOALS OF THE CHARTER

- **Information sharing -** allowing satellite operators to assist the ETC in supporting humanitarian responders, governments & affected communities in an efficient manner

- **An industry-led mechanism -** can be triggered by the ETC to invoke a coherent, predictable, scalable & principled end-to-end satellite-based solution

- **Training & capacity building -** ensuring the humanitarian community, local experts, governments, & response ow to use the equipment

PACIFIC ENDEAVOUR

- Joint military HA/DR exercise held every year for 25 Asia-Pacific militaries
- GVF has been supporting the program for several years
- August 2017 – provided 2 weeks training, certification and capacity building in San Hose, CA
- Certification provides pre-positioning of military first responders who can be called on – potentially by other militaries to apply their skills – based expertise in HA/DR

ADDITIONAL SLIDES

- FOR FURTHER INFORMATION

CERTIFICATION

- ✓ Nearly 14,000 Enrolled Techs
- ✓ Nearly 200 Examiners
- ✓ 30+ Courses
- ✓ Subscription Platform Launched
- ✓ Awards from SSPI, ACC
- ✓ Expanding to Reach Users…
- ✓ Including HA/DR

Maritime

Corporate

Backhaul

Peace Keeping

Disaster Preparedness

1) **Only applicable to NEW antenna models, so introduced to the market after the implementation date**

2) **Applicable to ALL antenna types and sizes within satellite communication**

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

Result 1: A Matrix

1) **Designed for C-Band, Ku-Band, Ka-Band**

2) **applicable to ALL antenna types and sizes within satellite communication**

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

C-BAND						
Item	unit	Comment	Fixed, central station (high powered)		VSAT	
Diameter	(m)		D >= 4.5	D<4.5	4.5 > D >=2.4	2.4 > D >= 1.2
Diameter equivalent to	(m)		n/a	n/a	n/a	n/a
D/λ		Reference frequency 6.025 GHz	D/λ >= 90	D/λ < 90	90.4 > D/λ >= 48.2	48.2 > D/λ > =24.1
Antenna sidelobe characteristics (aligned to geostationary arc)		Range end: +/- 9 deg, for each of the given off-axis gain requirements, 10% of the side-lobes are permitted to exceed the indicated mask by a maximum of 3 dB	32 - 25 log (θ)	29 - 25 log (θ)	32 - 25 log (θ)	32 - 25 log (θ)
Measured Co-polar pattern - with radome if applicable (low- mid- end high frequency band)		Antenna Gain patterns	AZ/EL plots	AZ/EL plots	AZ/EL plots	AZ/EL plots
Spurious Emission (Carrier Off)		Shall not exceed 4dBW/4KHz	applicable	applicable	applicable	applicable
Starts at α	(Deg)	Definition of starting point	α = 1 or 100*λ/D		α = 1 or 100*λ/D	
X-pol isolation within 1 dB contour - circular polarization	(dB)	Individual satellite operator could implement lower values in exceptional circumstances with E.I.R.P. restrictions	26	26	22	18
X-pol isolation within 1 dB contour - linear polarization	(dB)	Individual satellite operator could implement lower values in exceptional circumstances with E.I.R.P. restrictions	30	30	30	27

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

The SOMAP matrix is not intended to represent a new standard, replacing ITU, FCC, ETSI, etc.

The participating satellite operators keep their individual minimum antenna performance requirements in place

On a highly recommended basis, so not to be met on a mandatory basis

The SOMAP matrix is intended for exceptions

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

Result 2: A list of test data and questions - COTM only

1) To be requested / answered on a mandatory basis

2) applicable to ALL Comms-On-The-Move antenna models, also re-branded products

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

Result 3: Kind request to manufacturers to provide more performance data on product datasheets

A list with performance data, structural data and overall product information was designed, which would contribute to an efficient antenna approval process

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

Implementation date:

September 1st, 2018

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

Main goal of the industry

A clean RF spectrum

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

Expectations for the future

1) **Clarity in the antenna approval process**
2) **Gradual increase in product quality of COTM systems**
3) **Less turnaround time from satellite operators in approval process**

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

SOMAP group
Contact details

SOMAP@gvf.org

(Temporary)

SOMAP

Satellite operator's Minimum Antenna Performance Requirements – A Global VSAT Forum sub-group

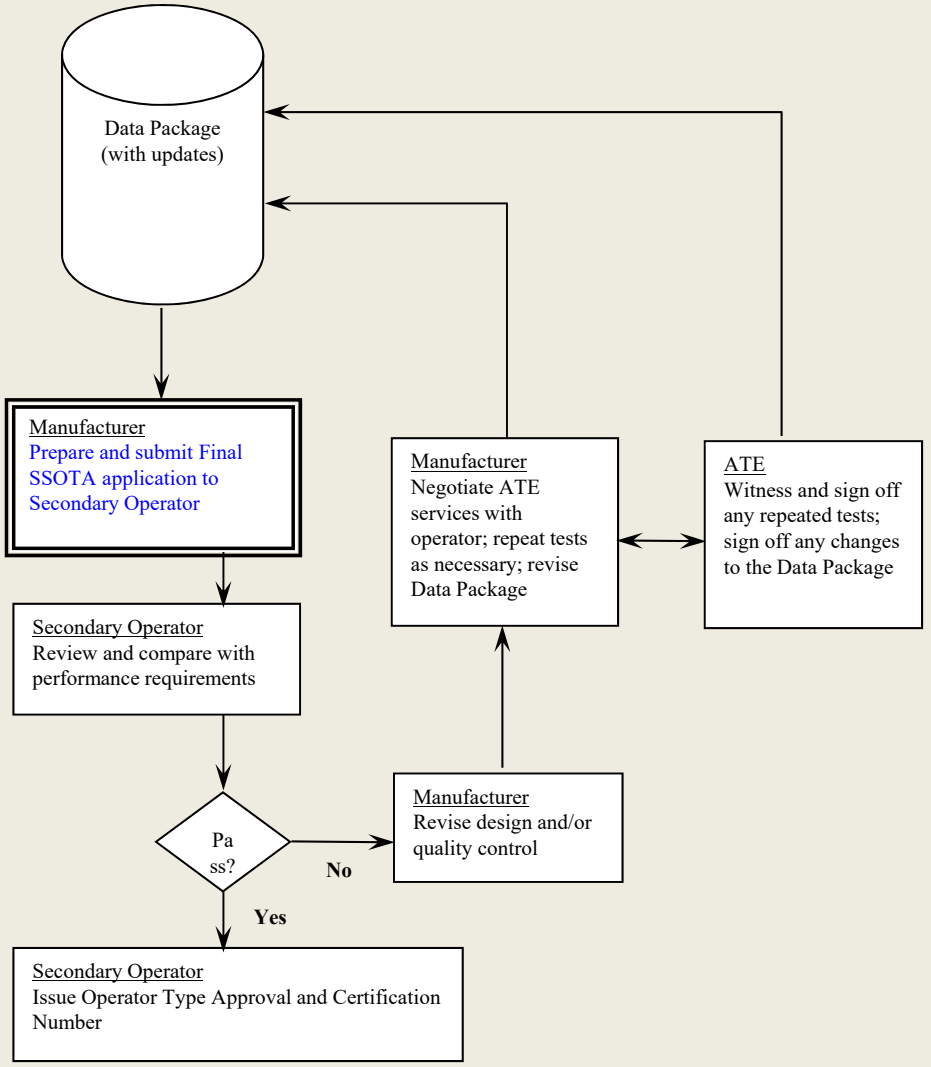
THE GVF-MRA

AS DEMAND FOR SATELLITE SERVICES GROWS, IT WAS QUICKLY REALIZED THAT A MORE EFFECTIVE SOLUTION WAS REQUIRED FOR APPROVING VSAT TERMINALS, OTHER THAN "ONE-TERMINAL-AT-A-TIME".

SOLUTION:

1. **GVF ESTABLISHED A FRAMEWORK WHEREBY INDEPENDENTLEY WITNESSED TESTS, CONDUCTED ON BEHALF OF ONE SATELLITE OPERATOR, WOULD BE RECOGNIZED BY OTHER OPERATORS WITHOUT THE NEED FOR ADDITIONAL TESTING.**
2. **THE GVF-MRA WAS CREATED TO ACT AS A NON-ALIGNED, INDEPENDENT ENTITY TO FACILITATE THE PROCESS.**
3. **WORKING TOGETHER, THE GVF-MRA AND SATELLITE OPERATORS DEVELOPED TYPE APPROVAL TEST DOCUMENTATION.**

THE GVF-MRA PROCESS



1. ***APPLICANT SUBMITS PHASE 2 TEST TO SSOTA.***
2. ***SSOTA REVIEWS REPORT AND GRANTS APPROVAL OR:***
3. ***SSOTA REQUESTS ADDITIONAL TESTS AND INFORMATION***
4. ***APPLICANT CONDUCTS ADDITIONAL ATE WITNESSED TESTS.***
5. ***APPLICANT SUBMITS REVISED REPORT TO SSOTA.***
6. ***SSOTA GRANTS APPROVAL.***
7. ***IT APPROVAL IS DENIED, APPLICANT HAS THE OPTION OF REPEATING TESTS***

GVF-105:
Satcom on the Move

- **DOCUMENT PRESENTS BEST PRACTICES FOR QUALIFYING COTM TERMINALS OPERATING IN C, X, Ku & Ka BANDS WITH SATELLITES IN FIXED GSO ORBIT LOCATIONS.**
- **COTM TERMINALS ARE FULLY STABILIZED AND MAY BE OPERATED FROM LAND, SEA OR AIRBORNE MOVING VEHICLES.**
- **ADITIONALLY, ANTENNAs USED IN COTM TERMINALS MUST SATISFY THE REQUIREMENTS OF GVF-101.**

ADDITIONAL PERFORMANCE / TEST REQUIREMENTS:

- **SATISFY DESIGNATED Co- & X-POL OFF-AXIS EIRPSD MASKS.**
- **DEMONSTRATE Tx INHIBIT FUNCTION IF THE BPE LIMIT OF 0.5° IS EXCEEDED FOR > 100 ms (TYPICAL SPECIFICATION)**
- **MAY USE COOPERATING ADJACENT SATELLITES FOR PRECISE ALIGNMENT.**

LAND MOBILE CAMPAIGN IN MILLBROOK PROVING GROUND: BELGIAN PAVÉ

- Straight section laid *rough* with cross ditches and random depressions

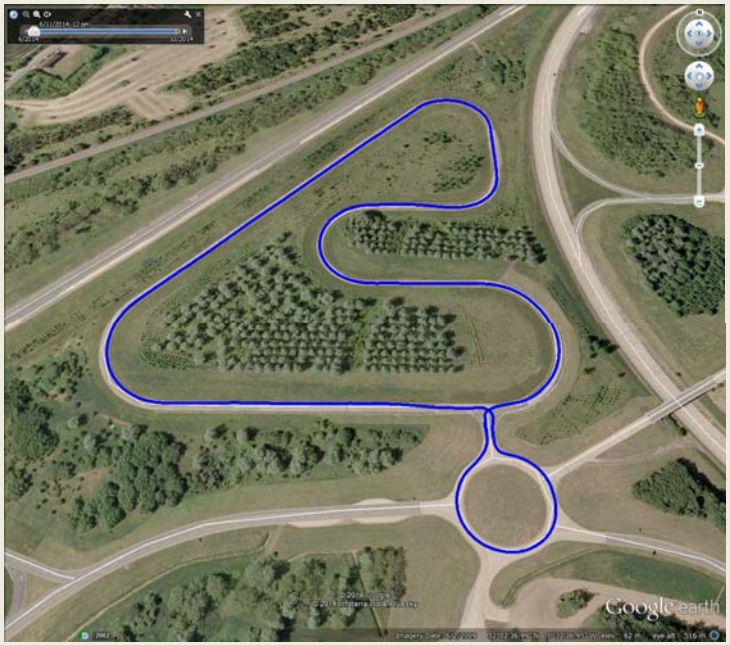


Figure: GPS position of Belgian Pavé track

Figure: Snapshot of Belgian Pavé

LAND MOBILE CAMPAIGN IN MILLBROOK PROVING GROUND

- [illegible]
- Maximum gradients between 26% and 35%
- Maximum ditch depth 3.5 m

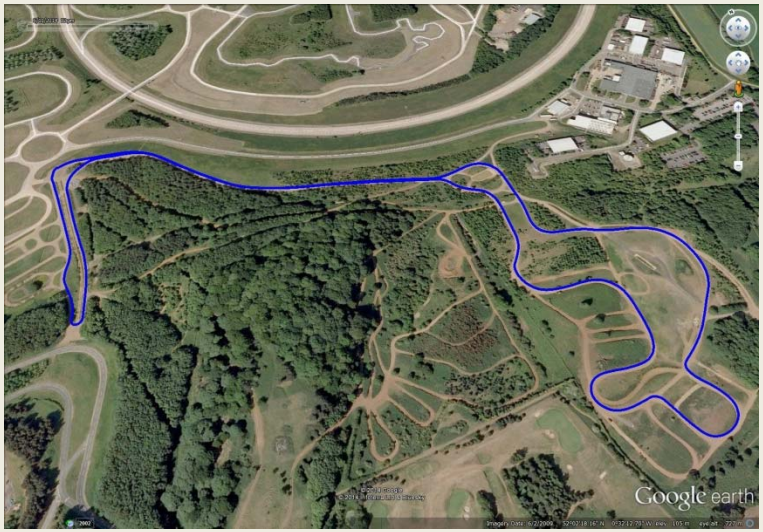


Figure: GPS position of Berm Road / Gravel Hills / Deep Ditches track

Figure: Snapshot of Berm Road / Gravel Hills / Deep Ditches track