

satellite Interference Reduction Group

formerly



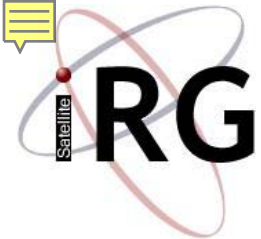
are dealing with...

Satellite Interference!

***...Jamming, Carrier ID and
Working Groups***

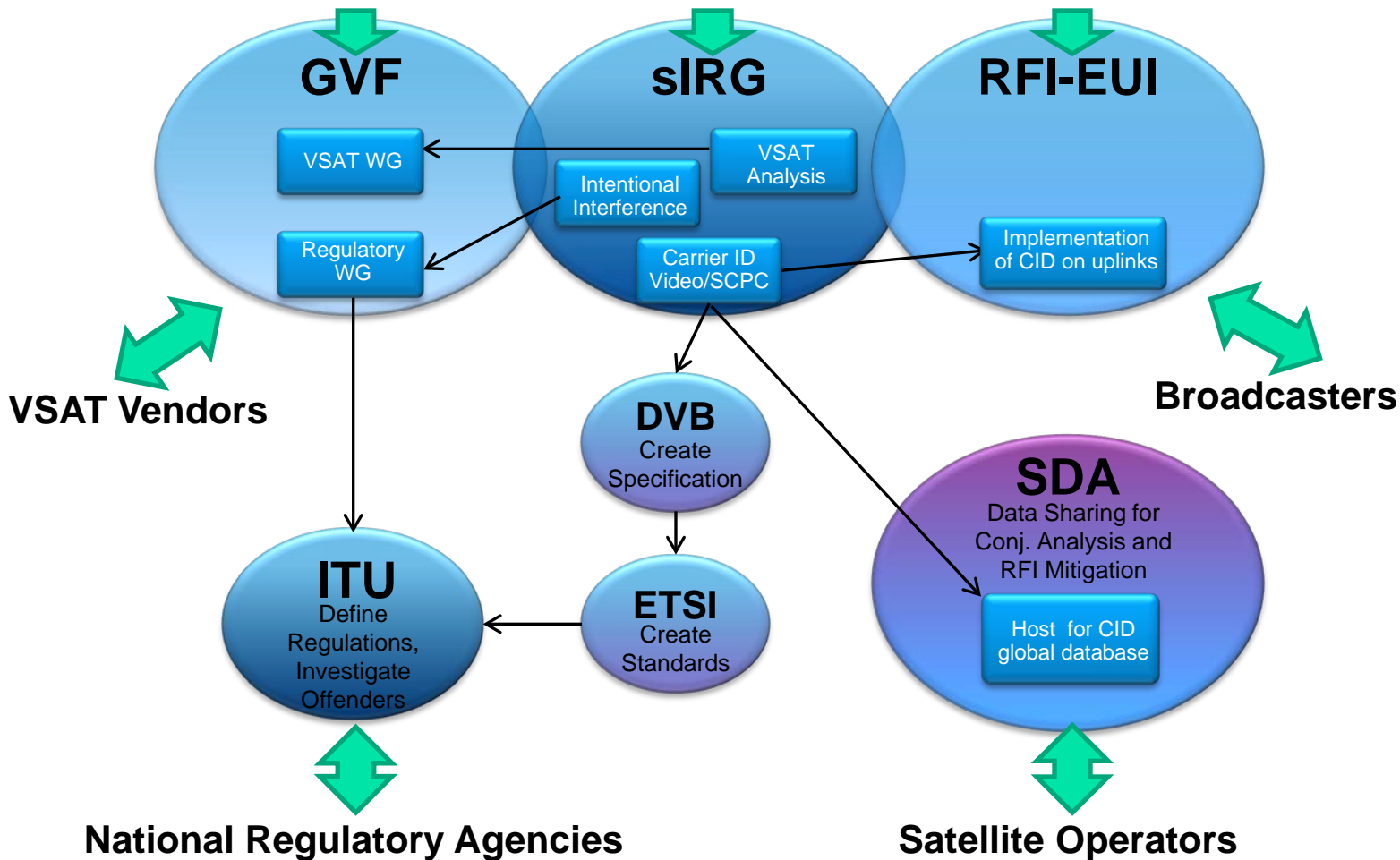
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...new IRG Working Groups & how they fit

Satellite Operators, Vendors, Users, Agencies, Interested Parties



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Working Group remit...

CID...

1. Setting up Processes
2. ID Database Creation
3. Moving forward with the new DVB Standard
4. Work with Manufacturers
5. CID Ready Logo
6. Engage the Broadcaster/Uplinker
7. Better Spectrum Monitoring
8. Start with SNG & NIT
9. Guide/Advise FCC Part 25 & OFCOM

VSAT...

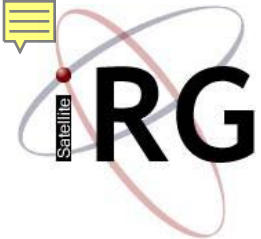
1. Assess all new Data
2. Assess Root Causes
3. Study at “Closed-Loop” Techniques
4. Study Tx Amplifier Technology – Remote Power Levelling
5. Study Cross-Pol Error Detection
6. Modernise Hub Controllers
7. Feed GVF VSAT Working Group
8. Assist GVF with Training Programs

DIFFICULT CASES...

1. Better Geo-Location
2. Predictive Methods
3. Suppression
4. Data & Records
5. Set Standards for Monitoring, Data & Recording Processes
6. Formal Evidence
7. Future Satellite Technology...
 - a) Electronic Beam Shaping
 - b) On-Board Geo

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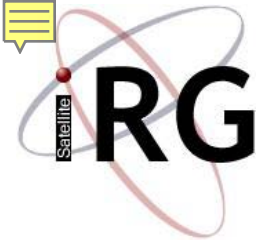
for more Working Group Information - Contact...

- DIFFICULT CASES: Yaser Hassan (ArabSat)
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- CID: Roger Franklin (Crystal Solutions)
Email: roger.franklin@crystalcc.com
- VSAT: Thomas van den Driessche (Newtec)
Email: tvd@newtec.eu
- Link to IRG 2012 Dubai Conference Presentations...

<http://sating.org/downloads/2012presentations/>

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Satellite RFI: the big 4!

Problems:

1. Improper Installations
2. Sub-Standard Equipment
3. Unidentified Carriers
4. Insufficient Incident Coordination

Solutions (Tools):

Proactive...

- ✓ Training & Certification
- ✓ Type Approvals
- ✓ Network Validation

Reactive...

- ✓ Carrier ID
- ✓ Data Sharing

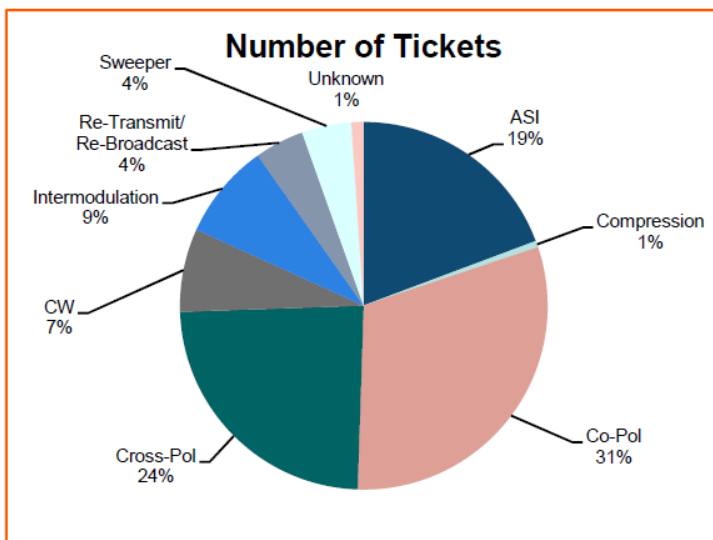
*...the CID Process allows these issues to be fully coordinated,
using CID as the Key!*

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SES Experience with RFI...



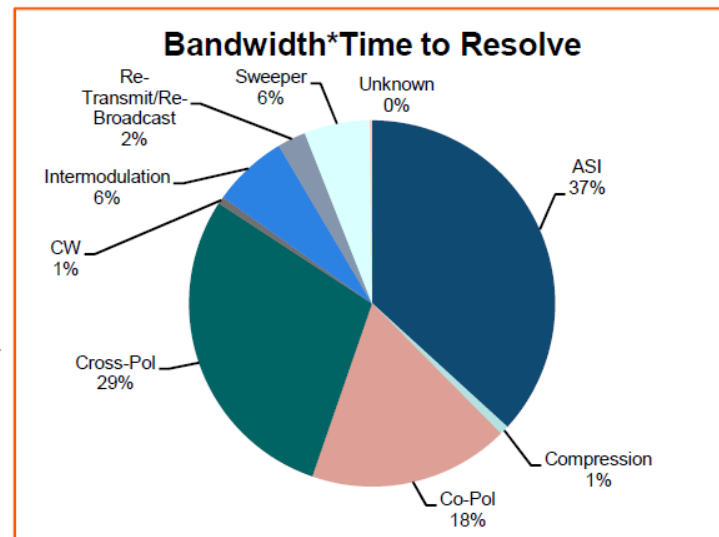
Source of data: SES Tickets Dec 2010-May 2011

RFI data based on the number of Tickets for each type of interference

- Roughly consistent distribution as other Operators
- Indicates that the major problems, in terms of the number of events, are Co-pol and X-pol from our own customers, followed by ASI

RFI data based on the impact of affected bandwidth and the length of time required to resolve each type of interference

- The most significant causes, in terms of the biggest impacts to the business and customers, are ASI and X-pol, due to the extensive time required to investigate and correct these types



Source of data: SES Tickets Dec 2010-May 2011

SES Proprietary – Not for Public Release

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Carrier ID Process "Road Map" - way forward

Broadcasters/
Users/Industry

Timeline...

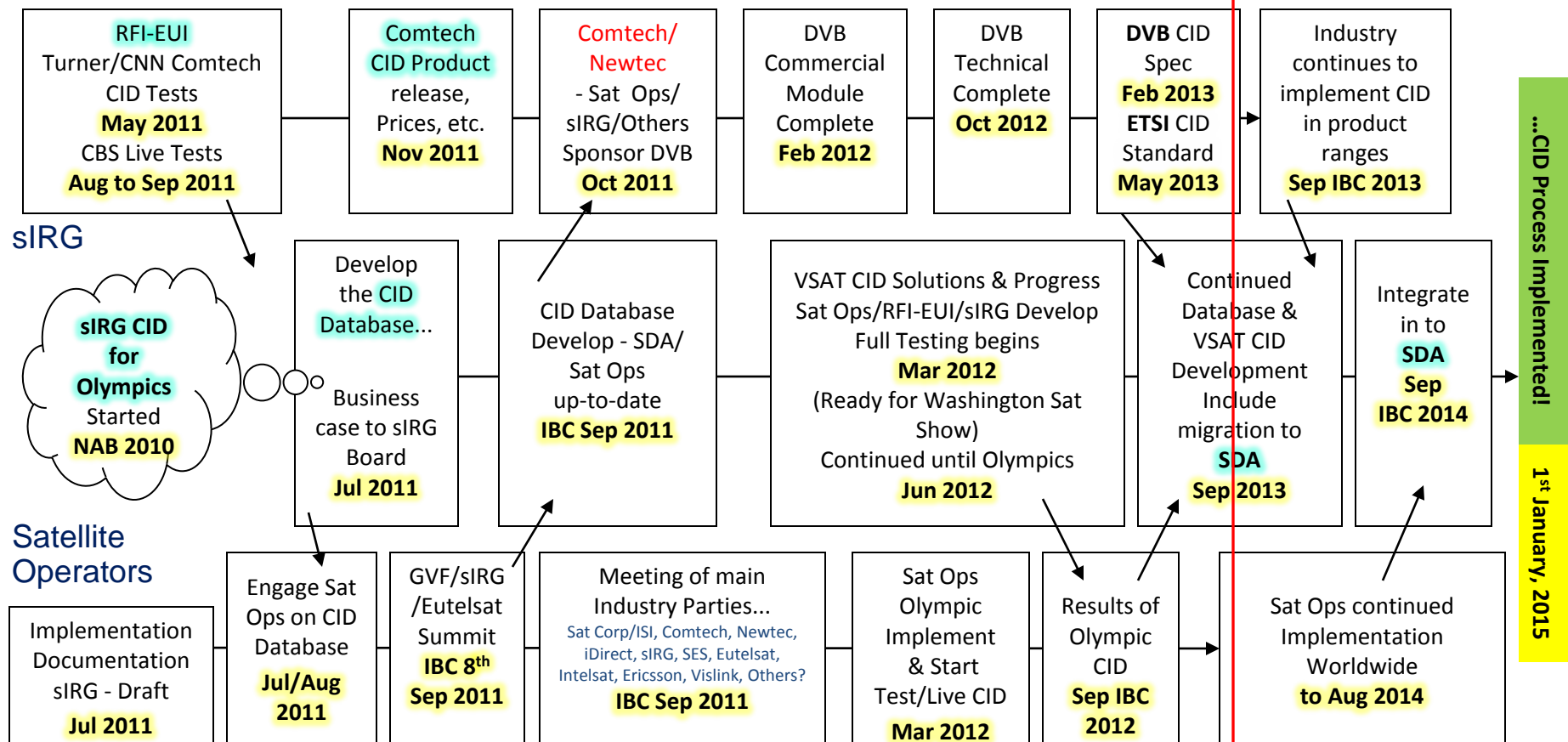
2011

2012

2013

2014

2015



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CID (using NIT) - the Olympics - the Process (Manual)...

Each Satellite Operator (e.g. Intelsat, SES & Eutelsat) ensures the NIT contains the...

- Manufacturer's Code
- Carrier ID # (Serial No/MAC Address –12 Characters max)

Optional - Satellite Operator name and contact info in to the User Field

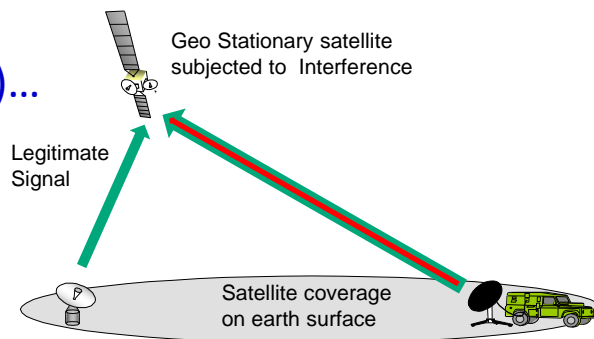


E.g. Sat Ops #1 detects & reports an Interfering Carrier
Carrier ID extracted & examined (e.g. User Info = Sat Ops #2)...

Then manually, cooperation between Operators...

Sat Ops #2 contacted & provided with Carrier ID#...

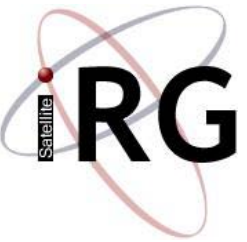
Sat Ops #2, using the reported Carrier ID#, determines
Customer and contacts for corrective action!



This ensures Customer Data stays **secure** with the responsible Satellite Operator!

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Moving Forward with CID...

Assuring
Anonymity



Satellite
Operators



Carrier ID is mapped
to Satellite Operators

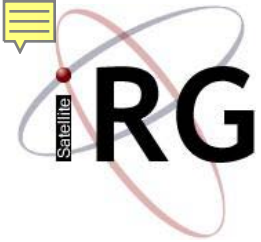
- Simple ID, simple fix!
- Operator-to-Operator Automation
- Use MAC Address only

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Use both NIT (ideal start for SNG) & migrate to DVB Standard...

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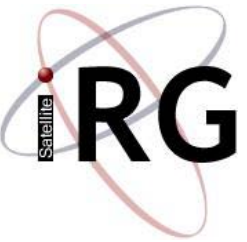
Database for CID...

The key components for the CID database are:

- Contains **contact information** for Satellite Operators (or references to contact information that is already contained in the SDA – *ensure common contact details at all times!*);
- Contains **CID**, one or more **Operators** that has a relationship with Uplinker transmitting the CID, a **Timestamp** when a satellite operator observed the CID on their fleet;
- **Operators populate the Data** in the database either manually (*CID is coded with checksum so that mistakes are caught*) or electronically through a secure web-services interface;
- Operators can **query** an **unfamiliar CID** and receive a list of operators that should have a relationship with that Uplinker transmitting the CID – Note: *One operator does not interface directly to an Uplinker that is a customer of another operator!*

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Requirements...

- Secure ID-to-Operator/User Link
- Simple Trace: Carrier-to-Operator
- Hold applicable Carrier Data details
- Accuracy Maintenance

Manufacture



Users



Operators

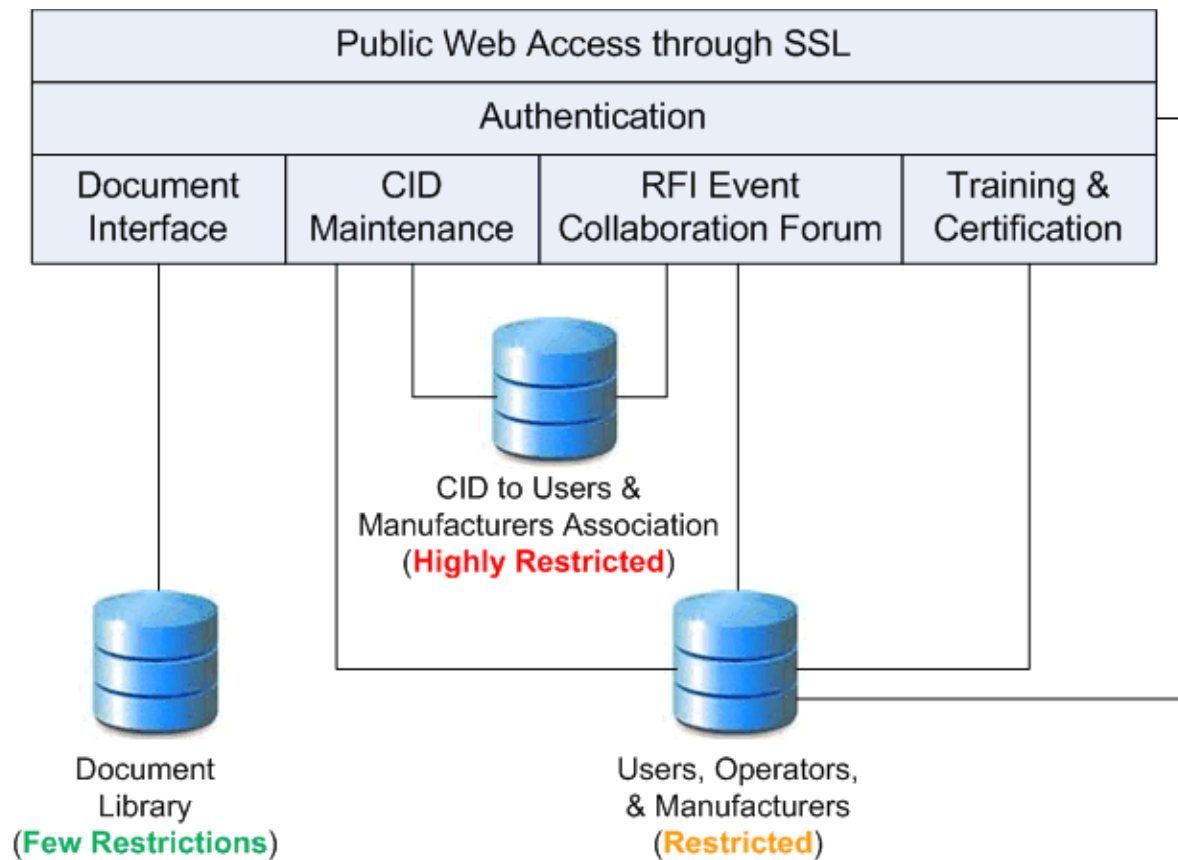


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Architecture...



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US FCC Regulatory Update - Majority Opinion...



- Respond to proposed FCC Rule Changes (Part 25) by Jan 14, 2013
- Push to require digital ATIS to be readable by satellite operators
- Push to require digital ATIS to conform to international standards, not specific technology
- Not required for TDMA VSAT networks, yet!

...leading to:

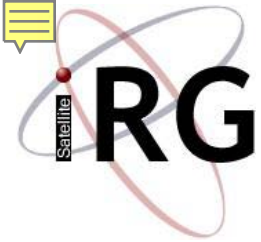


- OFCOM Draft to ID SNG Transmissions – from ITU WP4B?

Should seek US support and tie in with FCC, & current CID?

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Deliberate Jamming...

Abu Dhabi MilSatCom Intro for reference...

“As satellite communication technology evolves and continues to grow, satellite networks are increasingly subject to radio frequency interference from a variety of ground transmitters. In an interesting panel, regions SatCom users outline steps they undertake to eliminate interference and outline measures they expect from operators, regulators and system providers that can help their efforts.”

Affects to the Broadcaster & Regulation...

Jamming – Cover both Intentional and typical instances of Interference

Mention Short Wave issues (BBC World Service/VoA) *(Something the BBC reminded me of at CabSat!)*

ITU Perspectives of where we are regarding harmful Interference, mention

Geneva meeting 10th June where IRG/GVF will present a day forum to National Entities on this subject. *(see attached ITU Presentation (pdf only) to help)*

Note, previous Meetings/Events...

IRG Conference (Dubai) 18/19th November 2012

BBC World Service (London) 20th November 2012

Eutelsat (Paris) 18th January 2013

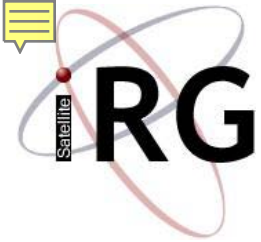
CabSat (Dubai) 12th March 2013

Satellite Show (DC) 21st March 2013

MilSatCom (Abu Dhabi) 8th May 2013

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Jamming - continued...

Proactive Solutions/Prevention...

An Audience reminder on Training, Installation, Certification & Quality Assurance/Type Approval Update on what is now available for SNG, how does Training help prevent – GVF Initiatives...

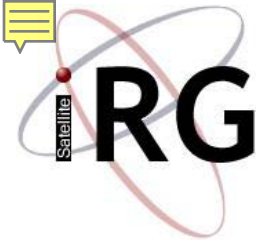
Note, we can add as part of the discussion period about RFI-EUIs role General Access Procedures and SNG Training, using this & other tools to help prevent interference in the first place, etc. etc.

Carrier ID...

Carrier ID DVB Standard - Bring us up-to-date with the DVB/ETSI, leading what really must be done to get CID implemented, require it, customers to specify it, etc. *(see other parts of this presentation)*

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Jamming - continued...

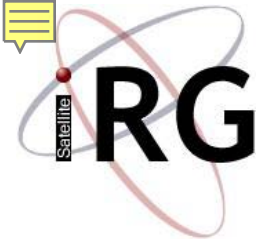
Reactive Solution – Processes, Tools & Technology...

Interference & Geo-Location

- Brief to intro Geolocation for the audience as the final approach when all other avenues have been exhausted...
- New standards to be developed for Geolocation Data output (*agreed at CabSat 2013 between SAT Corp, Siemens & Zodiac Aerospace*) including ITU request to initialize development of a standard for all ITU submissions. ITU Template received by IRG, first draft Geolocation Output Data template in time for Geneva meeting, 10th June 2013; with a view to creating an ISO standard...
- Thus improving evidence gathering!
- Discussion on allowing more monitoring stations to submit Geolocation data, with that standard, to allow more evidence of any single threat for the ITU to put forward to any entity, national or otherwise, to ensure accurate, common format, independently registered sourced evidence to provide that compelling case!

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Jamming - continued...

Reactive Solution – Processes, Tools & Technology (continued)...

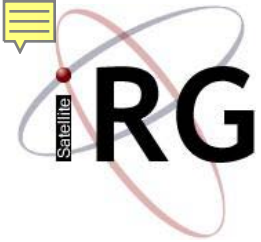
Interference & Geo-Location

- Predictive Geolocation, using the politics to govern where the most likely target services & put a “watch” on those services.
- Suppression (more to come on this ready for Geneva & Communic Asia); smart receivers/filtering; Better Service/Frequency Planning Strategies...

Leading to issues raised at other events on Deliberate Jamming, Database for Difficult Interference Case Events – next 3 slides...

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Database for Difficult Interference Case Events...

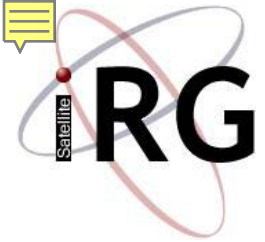
Creation of a database of all interference events – especially those caused Intentionally or by Piracy...

What Data would go into the Database?

1. Interference Received – satellite, transponder, start time, end time (when there is one)
2. Affected party – CID, geo-location of transmission, content, modulation parameters, company and contact
3. Interfering party – CID, geo-location of transmission, content (if any), modulation parameters (if any), company/contact (if known)
4. Spectrum details, Plots, Recordings, Log of Detection and Resolution Activity, etc.

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Database for Difficult Interference Case Events...

Creation of a database of all interference events – especially those caused Intentionally or by Piracy...

So Questions that should be Answered are...

a) What use would the Data be put to? (e.g. Space Data Association SDA)

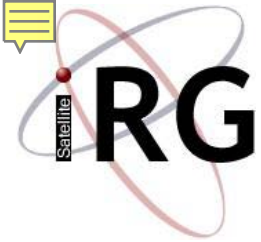
b) Who are the expected Contributors?

c) How possible is it to ensure that the Data was correct and that it was not being distorted by false information?

d) Would everyone be happy for their Data to be used for whatever purpose required by the users or administrators of the system (We understand that it would be against the rules to use it for commercial ends, but what about political situation?)

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Database for Difficult Interference Case Events...

Creation of a database of all interference events – especially those caused Intentionally or by Piracy...

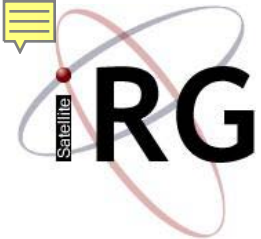
the Thinking...

This database would be populated and corroborated only by satellite operators. The affected party, and possibly the interfering party, would provide details to the satellite operators so that the data entered by satellite operators are as accurate as possible. The data would be used for trend analysis – content that is jammed, jammers, etc. Offenders, along with collected evidence, could be turned over to the ITU, the UN, and the governments of the affected and interfering party to support political negotiations.

Anonymous (without company, contacts or specific geo-location) data **might** be made available to research teams, overseen by IRG/SDA, that can use the data to design filters and other methods that would render jamming attempts ineffective.

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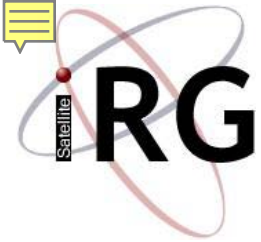


for more Group Information - Contact...

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- GVF: Secretary General: David Hartshorn
Email: david.hartshorn@gvf.org
- WBU-ISOG: Chairman: Dick Tauber
Email: dick.tauber@turner.com
- RFI EUI: Co-Chairs: Dick Tauber (CNN - see above)
(...for the Broadcaster perspective)
Rich Wolf (ABC)
Email: richard.p.wolf@abc.com

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...background on IRG

- The former Satellite Users Interference Reduction Group (SUIRG) was restructured in February 2011 and rebranded:

satellite Interference Reduction Group (IRG)

- It will actively pursue interference reduction by promoting:
 - Coordination with other industry organizations to address regulatory issues, and ensure adoption of Carrier ID
 - Investigation and development of new technologies and techniques
 - Assist in the development of training and certification programs for installers and users
 - Use of best operational practices
 - Support & coordinate with GVF, RFI-EUI, WBU-ISOG, APSCC
- Members total 34, including satellite operators and other organizations
 - New Members are wanted, to get new ideas, grow participation, expand industry-wide implementation of interference mitigation initiatives

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