satellite Interference Reduction Group

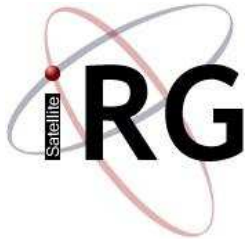are dealing with…

Satellite Interference!

…Carrier ID & Teamwork!

STOP Interference Now! (it's a SIN!)

formerly

**Technology based. Reducing satellite
interference through…**

Improving technology and processes

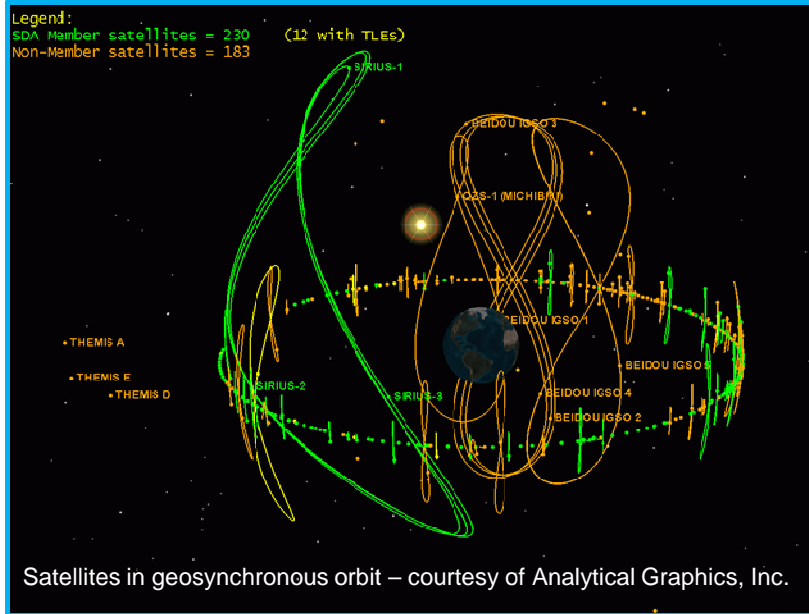Co-ordination with other industry groups

30 members, of which…

16 are satellite operators

STOP Interference Now! (it's a SIN!)

What is the cause of RFI?...

Legend:
SDA Member satellites = 230 (12 with TLEs)
Non-Member satellites = 183

Satellites in geosynchronous orbit – courtesy of Analytical Graphics, Inc.
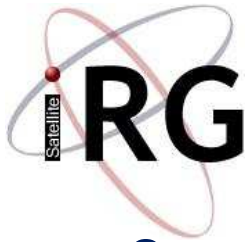
Greater number of satellites

Reduced orbital separation

Growth of small ground terminals

Low equipment cost; lower quality; lower margins

Poor installations and maintenance

Lack of operational training

Faulty equipment

Sometimes intentional, but rare
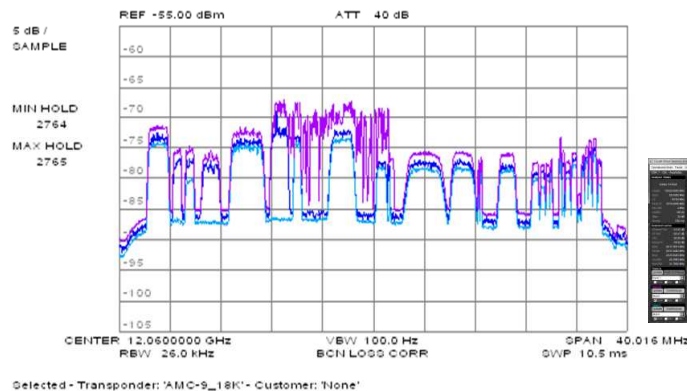
STOP Interference Now! (it's a SIN!)

What is Interference?…

➢ Sustainability of space – two main aspects:

    ➢ Physical security (collision avoidance, debris mitigation)

    ➢ *Electro Magnetic Interference (EMI) / Radio Frequency Interference (RFI)*

➢ Satellites are a shared resource (space, satellite, transponder)

    ➢ In-band RFI (RFI within the operating frequency range of the satellite)

Frequency spectrum of a satellite transponder
- *Blue trace is the authorized user signals*
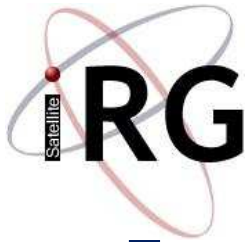- *Purple trace is authorized plus interference*

Users must be:
- *On the right satellite*
- *At the right frequency*
- *At the right power*

    ➢ Out-of-band (RFI from adjacent frequency bands from the satellite)

        ➢ Much higher power (e.g. terrestrial/mobile services) can affect the adjacent very low power satellite signals

STOP Interference Now! (it's a SIN!)

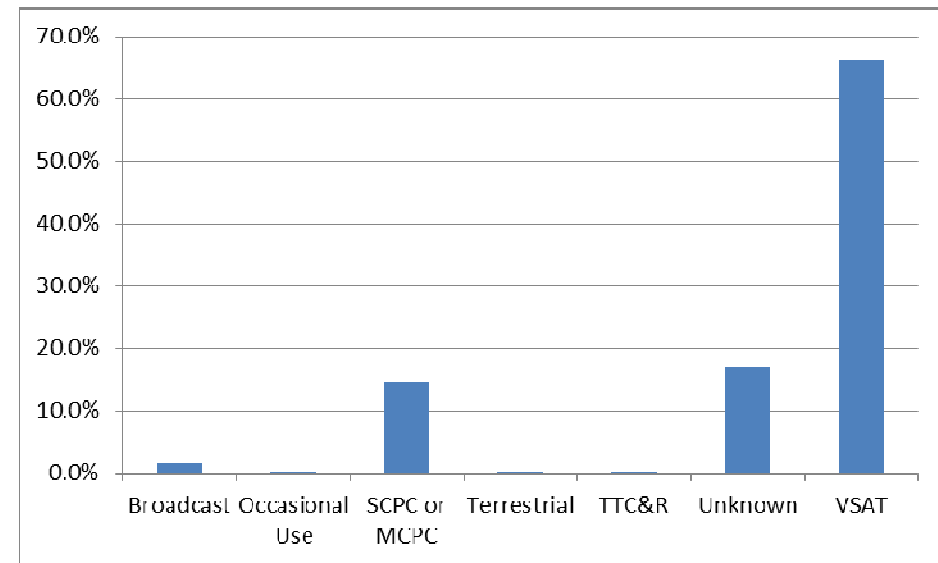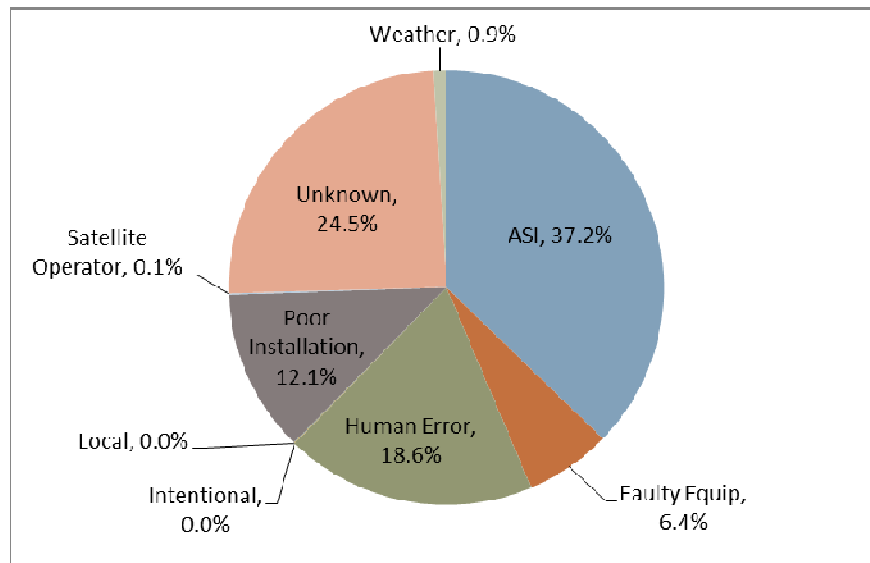# Types of RFI, and Impact to Industry…
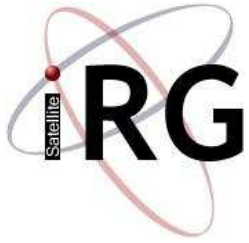
➢ To put it in perspective:

  ➢ The amount of capacity affected by RFI at any time, is very small compared to the total capacity

  ➢ However, for an affected customer, it is harmful interference

➢ Impact to industry:

  ➢ Poor quality of service; affects revenue; bad perception of satellites

STOP Interference Now! (it's a SIN!)

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

…IRG, through teamwork, has made Carrier ID

a Global Project!

STOP **I**nterference **N**ow! (it's a **SIN**!)
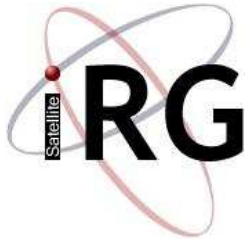
…the Team & how it fits!

Satellite Operators, Vendors, Users, Agencies, Interested Parties

GVF
- VSAT WG
- Regulatory WG

sIRG
- VSAT Analysis
- Intentional Interference
- Carrier ID Video/SCPC

RFI-EUI
- Implementation of CID on uplinks

VSAT Vendors

Broadcasters

DVB
Create Specification

SDA
Data Sharing for Conj. Analysis and RFI Mitigation
- Host for CID global database

ITU
Define Regulations, Investigate Offenders

ETSI
Create Standards

National Regulatory Agencies

Satellite Operators
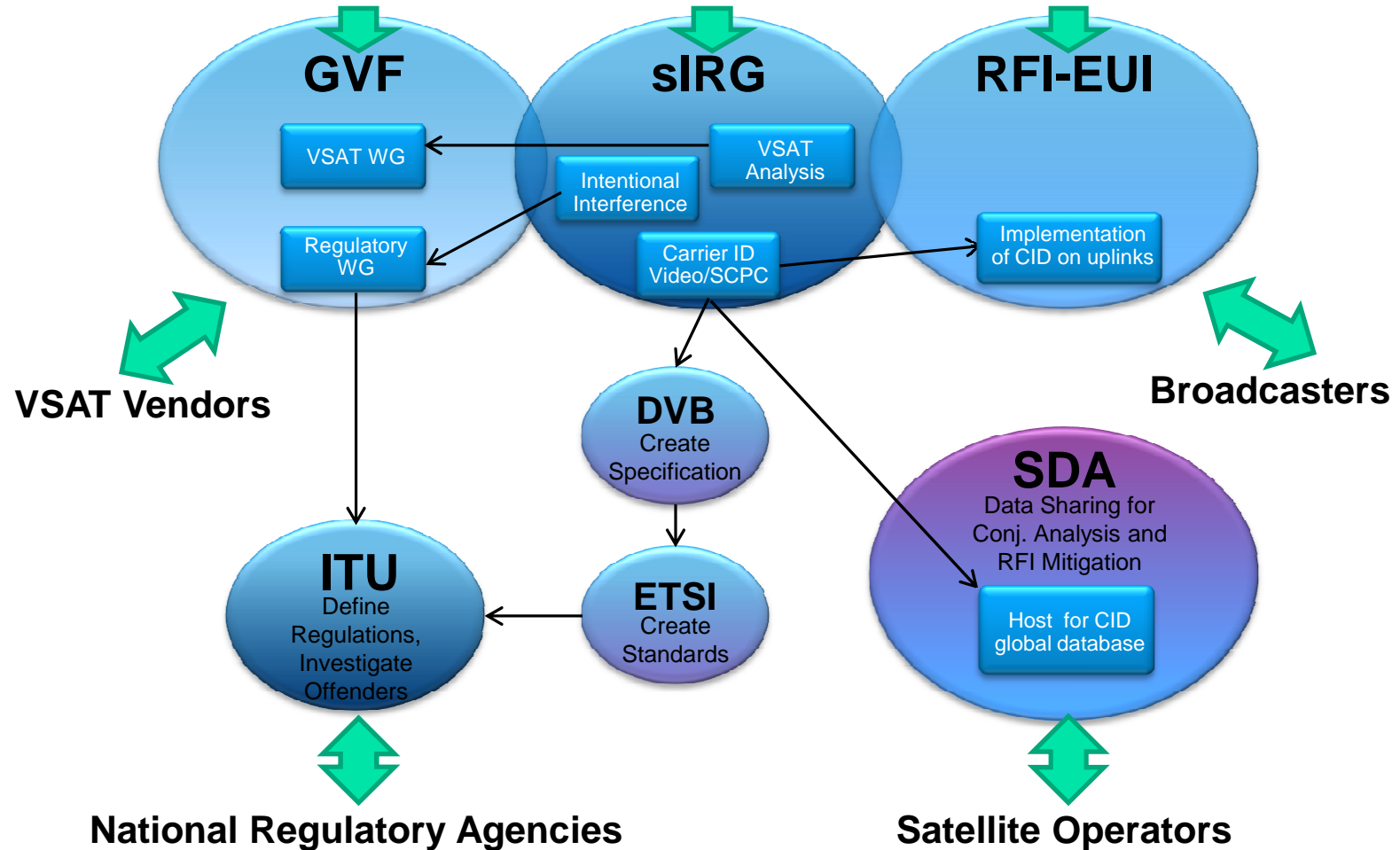
STOP Interference Now! (it's a **SIN**!)

3. The ID is read from the Carrier by
1. An Identifier is injected into the Carrier by the modulator
2. The Carrier ID is transported over
Special Measurement Receivers
Satellite Below the Noise

Source

SOURCE

**M6100 CARRIER ID
SETUP**

**MDM6000 MODEM
M6100 MODULATOR**

- Fixed Source Identification
- User Configurable Data

STOP **I**nterference **N**ow! (it's a **SIN!**)

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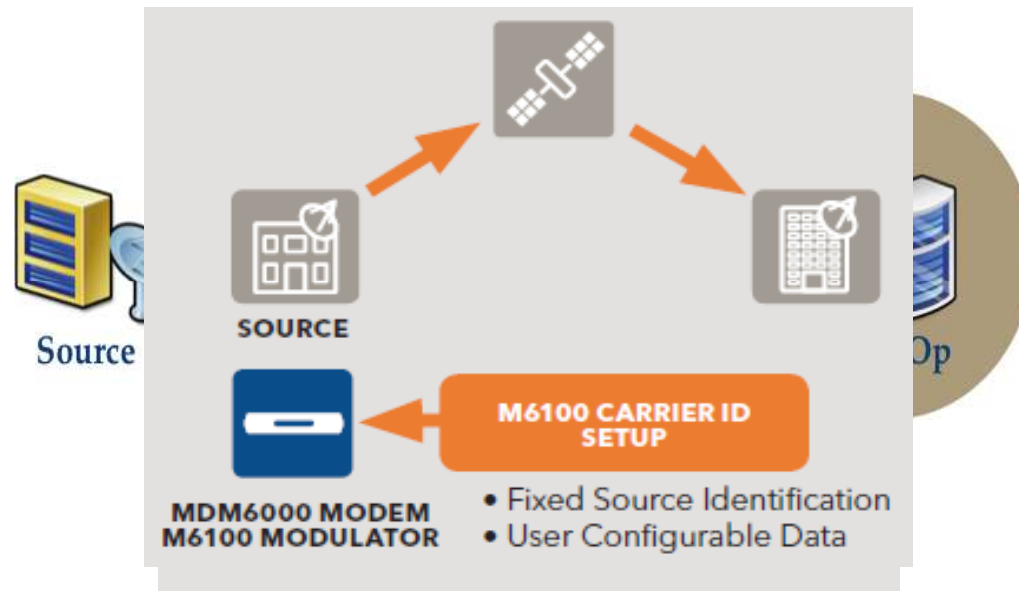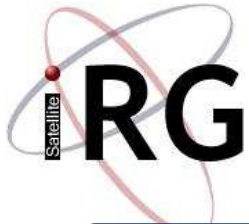
DVB CID standard relies on spread spectrum technology in modems/ modulators to embed CID in satellite transmissions

Mandatory Information – Fixed by the equipment manufacturer

64-bit DVB CID Global Unique Identifier:
Derived from a 48 bit MAC address or a 48 bit Space Data Association (SDA) modulator identifier

CID Format:
A revision code anticipating possible changes in the revision number and possible content of the fields in the Content ID table

Optional Information – Added by end user

Carried in the Content ID table:

Latitude and longitude

Telephone numbers (up to 3)

User defined data fields (up to 7)

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The End of the Beginning!

DVB completed its work on CID February 28th 2013

http://www.dvb.org/technology/standards/a164_DVB-CID_Carrier-ID_spec.pdf

ETSI published the standard 29th May 2013!

ETSI TS 103 129

http://www.etsi.org/deliver/etsi_ts/103100_103199/103129/01.01.01_60/ts_103129v010101p.pdf

STOP **I**nterference **N**ow! **(it's a SIN!)**

Finalize CID standard

Complete by June 1, 2013

Implementation of standard by manufacturers

Some already implemented

70% by end of 2013

How best to encourage all to implement?

Requirement for CID by end users in all new purchases

What will encourage end users to require it?

Requirement for CID by satellite operators in all uplink transmissions

Target date: January 1, 2015
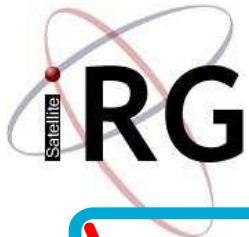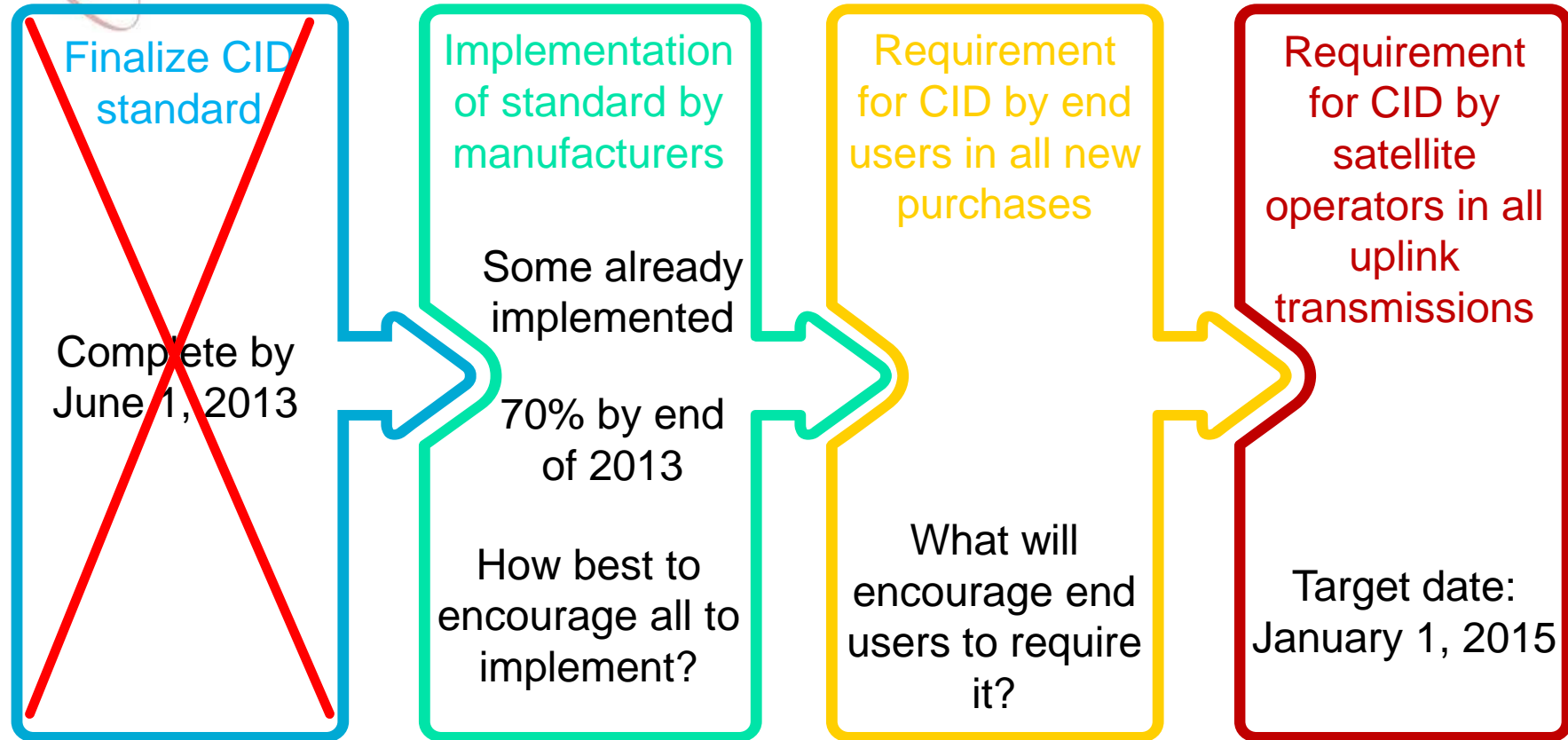
Completion of the CID standard is only the beginning…now the real work begins

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Latest WBU-ISOG Resolutions…

At the conclusion of the recent WBU-ISOG Forum (May 15-16, 2013) held at Fox Networks in Los Angeles, there was agreement to issue a resolution in support of the recently adopted Carrier ID standard issued by ETSI (European Telecommunications Standards Institute) – ETSI TS 103 129 v1.1.1 (2013 – 05). With this positive step forward by the industry to identify satellite transmissions of video content and as a means to mitigate harmful satellite interference, WBU-ISOG supports the following resolutions:
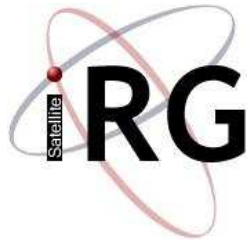
Exclusions and their Definition

The requirements for transmission of Carrier ID do not apply to MSS
systems which automatically configure frequency, power level, polarization and transmit inhibit according to commands issued by a central control mechanism which is in the control of the satellite operator.

The ETSI (European Telecommunications Standards Institute) – ETSI TS 103 129 v1.1.1 (2013 – 05) standard does not address systems that use TDMA or other types of burst carriers, and as such, equipment or systems that use TDMA or burst carriers are excluded at present from these resolutions.

RESOLUTIONS:

WBU-ISOG supports the requirement that, by no later than January
1, 2015, all new model modulators and codecs with integrated modulators purchased by end users for video uplinking contain a Carrier ID (CID) that meets the ETSI TS 103 129 standard issued May 29, 2013.

Based on Resolution #1 and with immediate effect, the WBU-ISOG supports the requirement that all uplinkers of SCPC and MCPC Video and Data, fixed and mobile systems shall include Carrier ID functionality in the required specifications of all current and future RFP's (Request for Proposal) or RFQ's (Request for Quote) issued to equipment manufacturers regarding the purchase of modulators and/or codecs with integrated modulators.

The WBU-ISOG supports the requirement that all satellite operators, by no later than January 1, 2015 start the transition to use Carrier ID that meets WBU-ISOG NIT or the ETSI standard for all SNG, DSNG and any other New Uplink transmission services.

The WBU-ISOG supports the requirement that all uplinkers by no later than January 1, 2018 shall ensure that Carrier ID is included for all their respective SCPC and MCPC Video and Data transmissions.

The WBU-ISOG supports the requirements that CID NIT shall be phased-out in preference to the ETSI standard by January 1, 2018.

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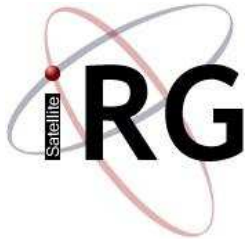
Moving Forward with CID…

Assuring Anonymity

Satellite Operators ←→

Carrier ID is mapped to Satellite Operators

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➢ Simple ID, simple fix!

➢ Operator-to-Operator Automation (SDA)

➢ Use MAC Address only

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

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Architecture & the SDA…

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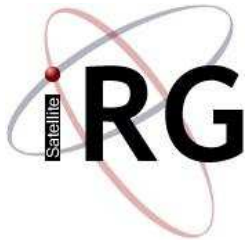
Carrier ID "Road Map" & working together…
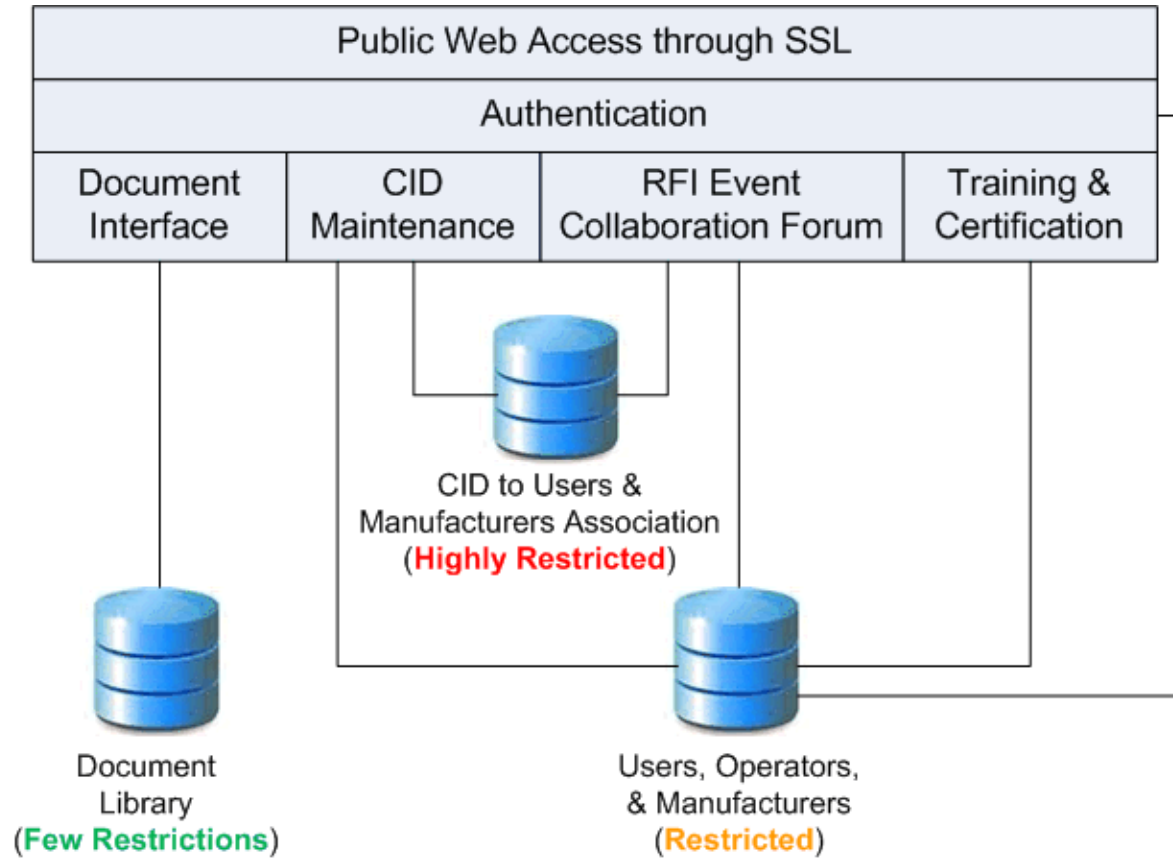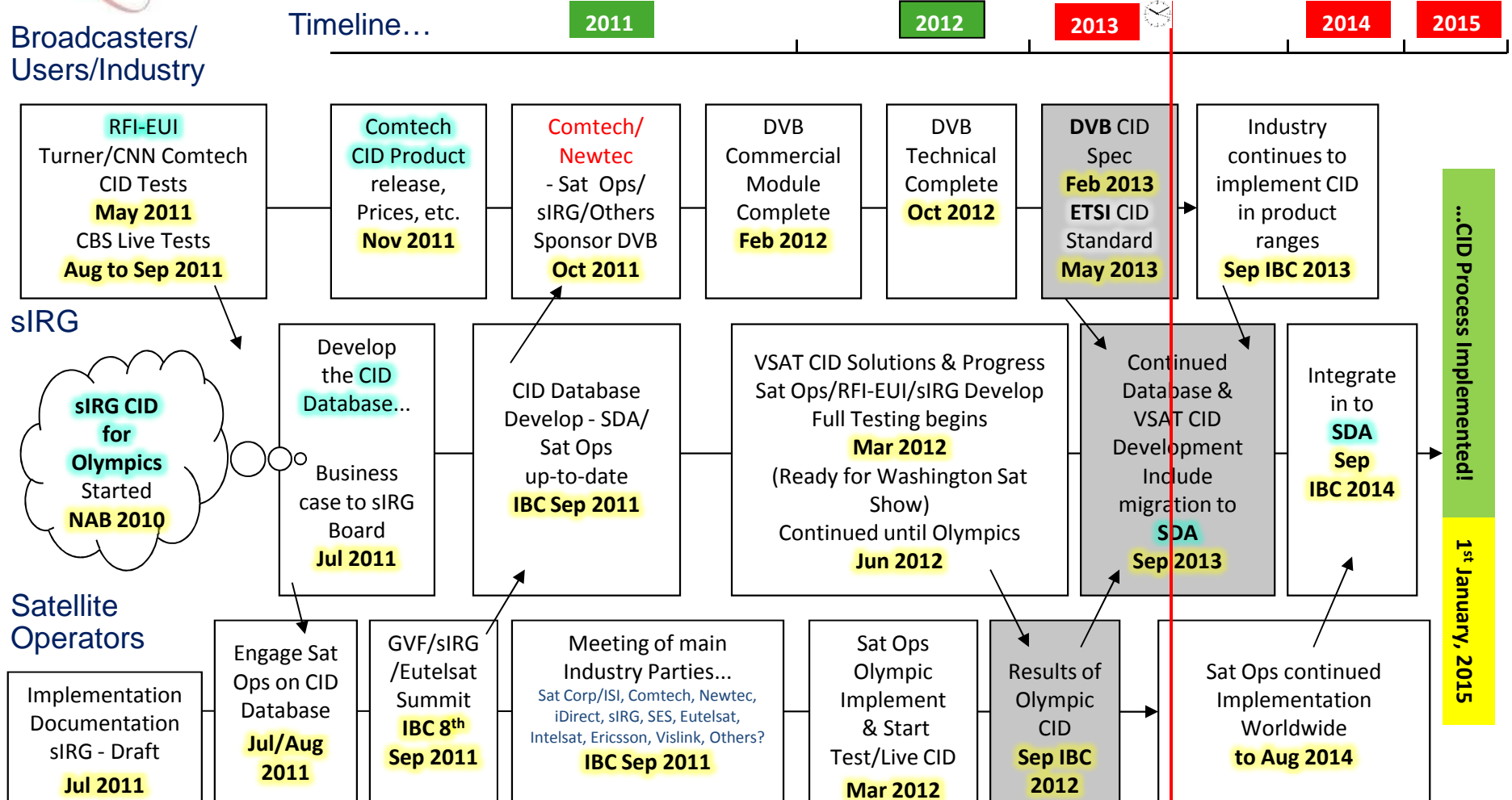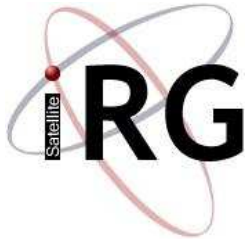
Timeline…

| 2011 | 2012 | 2013 | 2014 | 2015 |

Broadcasters/Users/Industry

- **RFI-EUI** Turner/CNN Comtech CID Tests **May 2011** CBS Live Tests **Aug to Sep 2011**
- Comtech **CID Product** release, Prices, etc. **Nov 2011**
- Comtech/ Newtec - Sat Ops/ sIRG/Others Sponsor DVB **Oct 2011**
- DVB Commercial Module Complete **Feb 2012**
- DVB Technical Complete **Oct 2012**
- **DVB** CID Spec **Feb 2013** ETSI CID Standard **May 2013**
- Industry continues to implement CID in product ranges **Sep IBC 2013**

sIRG

- **sIRG CID for Olympics** Started **NAB 2010**
- Develop the **CID Database**… Business case to sIRG Board **Jul 2011**
- CID Database Develop - SDA/ Sat Ops up-to-date **IBC Sep 2011**
- VSAT CID Solutions & Progress Sat Ops/RFI-EUI/sIRG Develop Full Testing begins **Mar 2012** (Ready for Washington Sat Show) Continued until Olympics **Jun 2012**
- Continued Database & VSAT CID Development Include migration to **SDA Sep 2013**
- Integrate in to **SDA Sep IBC 2014**

Satellite Operators

- Implementation Documentation sIRG - Draft **Jul 2011**
- Engage Sat Ops on CID Database **Jul/Aug 2011**
- GVF/sIRG /Eutelsat Summit **IBC 8th Sep 2011**
- Meeting of main Industry Parties… Sat Corp/ISI, Comtech, Newtec, iDirect, sIRG, SES, Eutelsat, Intelsat, Ericsson, Vislink, Others? **IBC Sep 2011**
- Sat Ops Olympic Implement & Start Test/Live CID **Mar 2012**
- Results of Olympic CID **Sep IBC 2012**
- Sat Ops continued Implementation Worldwide **to Aug 2014**

…CID Process Implemented!

1st January, 2015

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THANK YOU!

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