



# GCF Antenna Testing

Workshop: Receiver performance of mobile telephones  
Brussels April 10, 2014

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# Objective of Presentation

- GCF is addressing OTA performance in depth already for global markets including Europe, wants to offer knowledge of our work to the meeting.
- GCF would welcome broader engagement in current GCF strategy review for future needs on this topic, and to make it potentially useful to a wider 'customer' / 'user' base
- GCF wants to avoid parallel industry activities and build efficiency and consistency.



# QUICK INTRODUCTION

# What is GCF?

- Founded in 1999
- Originally established to define a common benchmark of interoperability for GSM devices
  - Complementing the R&TTE Directive for the European Single Market
- Incorporated as not-for-profit company since 2008
  - Global Certification Forum (GCF) Ltd
  - UK Company Registration Number 6594830
  - Owned by members
- Membership from all key regions
  - Operators, Associate Operators
  - Manufacturers, Associate Manufacturers (M2M), Client Vendors (RCS)
  - Observers (test industry & other mobile industry stakeholders)
- Consensus oriented work
  - If needed: Dual Majority Voting - Operators & Manufacturers

# GCF Current Objectives

- To maintain and strengthen the current scope of GCF and its robust and respected GCF Certification regime.
- To provide framework and associated processes for the harmonization of test requirements with the aim of avoiding duplication of testing
- To enable the certification of all devices that include 3GPP & 3GPP2 Radio Technologies
- To promote the certification of all devices irrespective of the distribution channel
- To ensure GCF Certification is open to other areas of mutual benefit to GCF Members and the industry
- GCF is undertaking a strategic review focussed on its members' needs in a rapidly evolving industry, which may modify and add to its objectives for 2015+

*“Test once, use anywhere”*

# Current Work Focus

- Strategic Review
- New regions – India & Latin Americas
- Increase footprint in China (Workshop June 5)
- Addressing the M2M market
- RCS clients and UICC based NFC services
- LTE Advanced & new LTE bands
- Review of OTA requirements due to device evolution



# Membership

## GCF Membership

### Operators

- 20+

### Associate Operators

- 98

### Manufacturers

- 59+

### Associate Manufacturers

- 10+

### Client Vendors

- 1+

### Observers

- 77+

### Total Membership

(April 11, 2014)

- 265

- All major EU operators
- Top 15 manufacturers



## GCF Board Members

- Sprint - Chair
- Vodafone
- Telecom Italia
- Verizon
- China Mobile
- Orange
- Telefonica
  
- BlackBerry (2x)
- Samsung
- Qualcomm
- Ericsson
- Sierra Wireless
- Panasonic
  
- GSMA (non-executive)
- CCF (non-executive)

<http://www.globalcertificationforum.org/members.html>

# OPEN MARKET COVERAGE EU



# Analysis of Carphone Warehouse (UK)

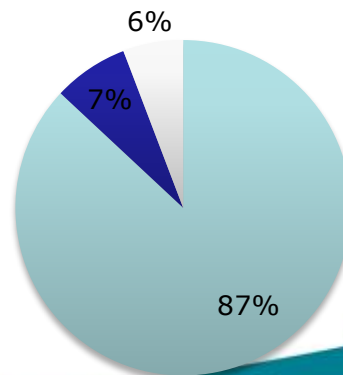
- **Aim:** To give a snapshot of the proportion of devices on-sale at a major independent phone retailer that are GCF-certified. Test hypothesis that most devices will be GCF-Certified or Apple.

## Results:

- 69 devices for online sale on 28<sup>th</sup> August 2013.
- 87% (i.e. 60 devices) are GCF certified, 7% (5 devices) are Apple iPhones.
- Uncertified devices (excluding Apple) tend to be low-priced GSM only handsets. These account for 6% (4 devices) of devices on sale.

### Proportion of devices on sale by Carphone Warehouse (UK) that are GCF certified

■ GCF Certified   ■ Apple iPhone   ■ Other non-GCF certified devices



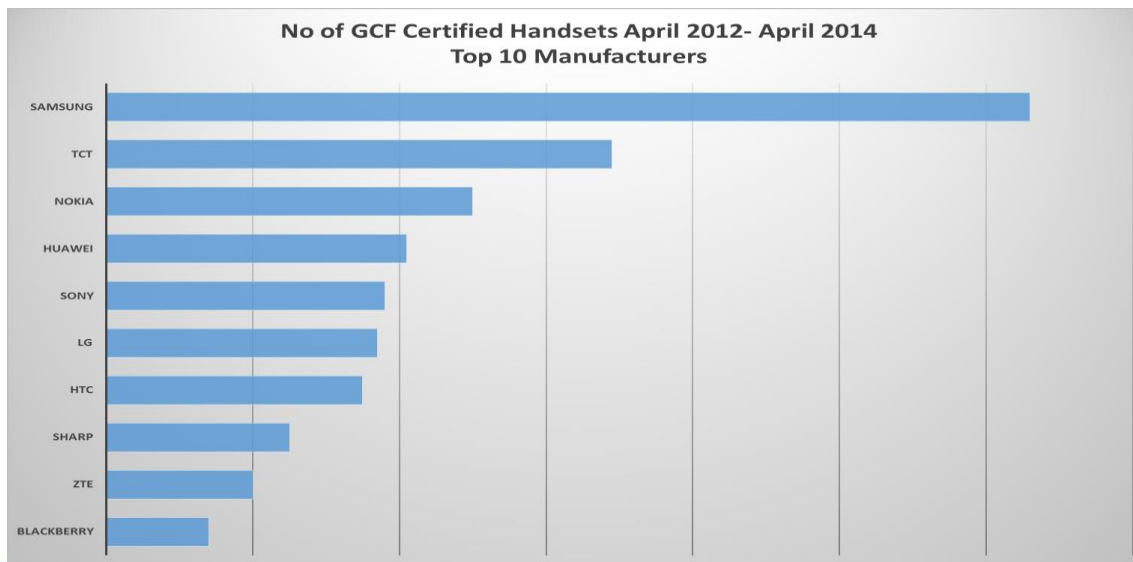
# Danish Market

- Investigations based on products listed for online sale in April 2014
- TDC, Telenor, Telia, 3 (Largest DK operator)
  - Apple, Samsung, LG, Nokia, HTC, Sony, Huawei, Doro
  - Models GCF certified except
    - Apple, Doro
- Elgiganten (Largest DK electronics retail chain)
  - Apple, Samsung, LG, Nokia, HTC, Sony, Huawei, Doro, NGM, Alcatel, Emporia
  - Models GCF certified except
    - Apple, Doro, NGM
- Note:
  - Doro (easy to use phones) is in the process of becoming GCF member
  - Apple is GCF member
  - NGM models is low cost GSM Android products manufactured by Gionee Communication Equipment Co. Ltd, Shenzhen



# Conclusion on open market coverage (EU)

- Based on UK/DK data
  - Assumes same situation in other EU markets
- All high volume models are covered by GCF certification
  - “Apple does do all the testing (including Antenna) and provide the data on a 1-2-1 basis with each operator Apple is engaged with”
  - Few open market products not certified
    - Less than 5% of the market
    - Low cost GSM products
    - Assumption that chipset/stack has been verified against by the chipset supplier
    - Successful open market manufacturers will join GCF to ensure growth



# ANTENNA PERFORMANCE IN GCF

# GCF Antenna Testing - Conformance

- Conformance Testing TRP/TRS
  - Covers all EU bands for GSM and WCDMA (3GPP 34.114)
    - Result from CTIA OTA testing may be used
  - Speech position
    - Normative limit must be met
    - May also indicate if recommended limits of 25.144 are met
  - Data transfer position
    - 3GPP limit is TBD - CTIA limits to be used
- Reporting: Compliance with Normative respective Recommended Limits
- Purpose: To ensure device meets minimum requirements

# GCF Antenna Testing - Performance

- Optional Performance Testing TRP/TRS
  - Multiple positions:
    - Free Space, Head+hand Left side, Head+hand Right side, Left Hand only
  - Coverage GSM & WCDMA:
    - GSM bands: 850, 900, 1800, 1900
    - FDD bands: I, II, III, IV, V, VIII
  - Coverage LTE
    - LTE FDD 1,2,3,4,5,7,8,12,13,14,17,20,25,26,27
    - LTE TDD 38,39,40,41
- Reporting: Values for bilateral sharing between manufacturers and operators
- Purpose: Agreed common configurations across operators



# GCF Antenna Testing - Issues

- Lack of limits in the 3GPP specifications
  - data transfer position
  - LTE
  - laptop mounted equipment (LME) plug-in UEs & laptop embedded equipment (LEE) UE
- Use of CTIA OTA test plan has restrictions for use by GCF
  - Proprietary test plan, fee to use test plan
  - Testing to take place in CTIA Authorized Test Laboratories
  - Test method to allow operators own limits
- GCF planned future work
  - Overall review of antenna testing requirements
  - Proposals for how to address areas w/o limits
  - Limits for modules with integrated antenna vs final products



# BACKUP INFORMATION GCF

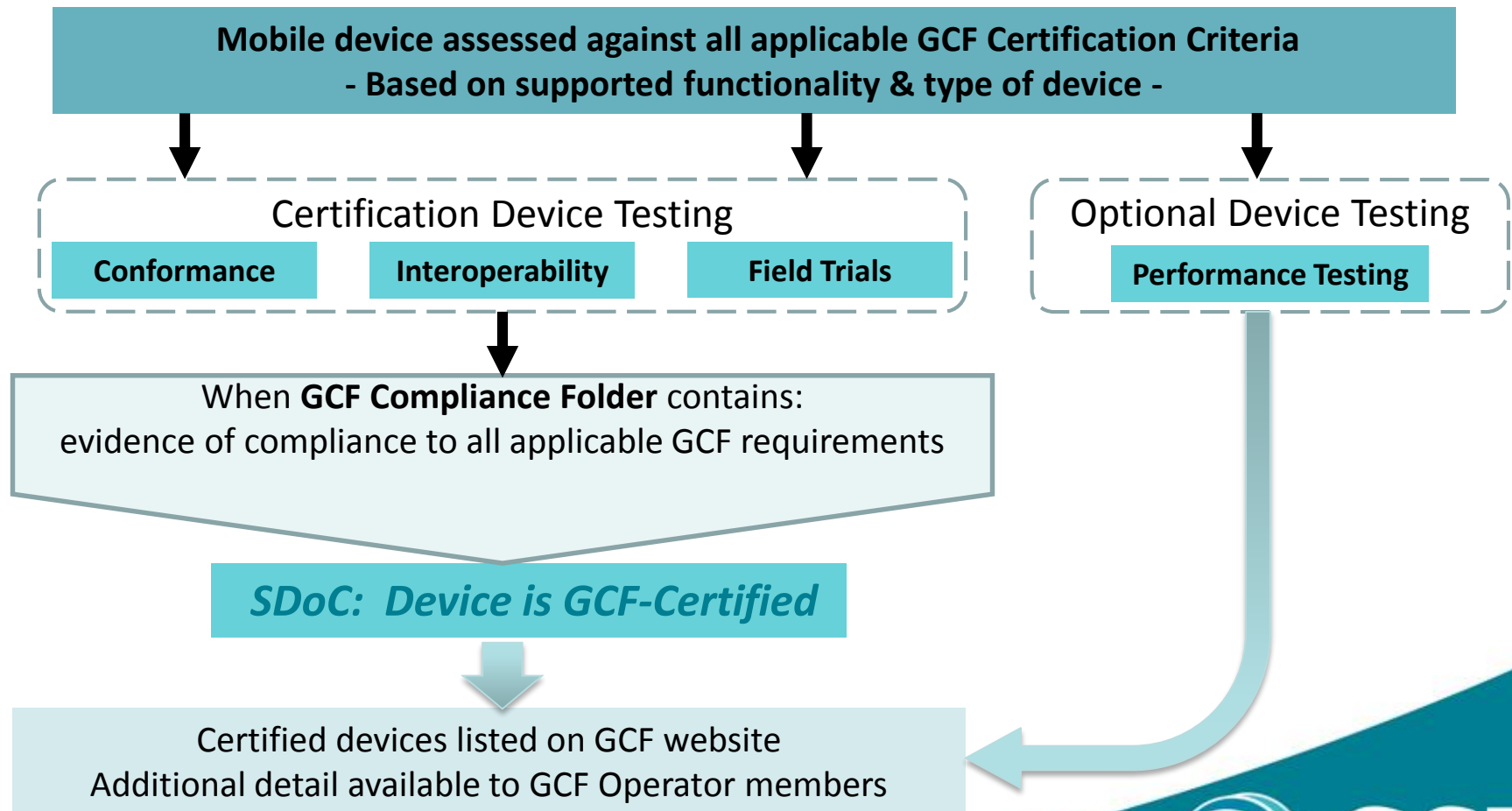


# GCF Certification

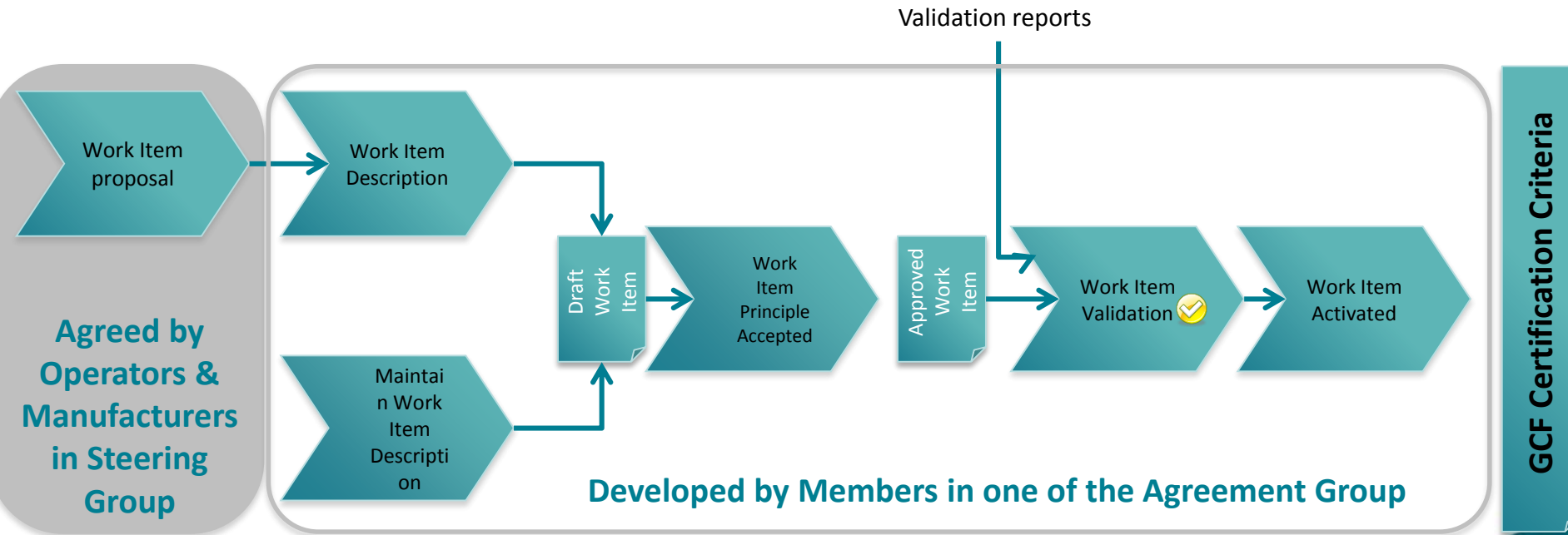
- Complements regulatory schemes (which focus on spectrum utilisation, EMC, user safety)
- Certification Criteria based on core standards from SDOs
- Scheme has expanded to encompass all 3GPP/3GPP2 technologies – from GSM to 3G (UMTS/WCDMA/CDMA2000) & LTE (FDD & TDD) as well as application enablers, RCS clients and UICC based NFC
- Test cases agreed by the industry for the industry
  - Relevant to the real needs of operators and device manufacturers
- Focused on:
  - Providing a platform for harmonisation of testing
  - Avoidance of duplication of testing
  - Reducing testing overheads for manufacturers and operators

*“Test once, use anywhere”*

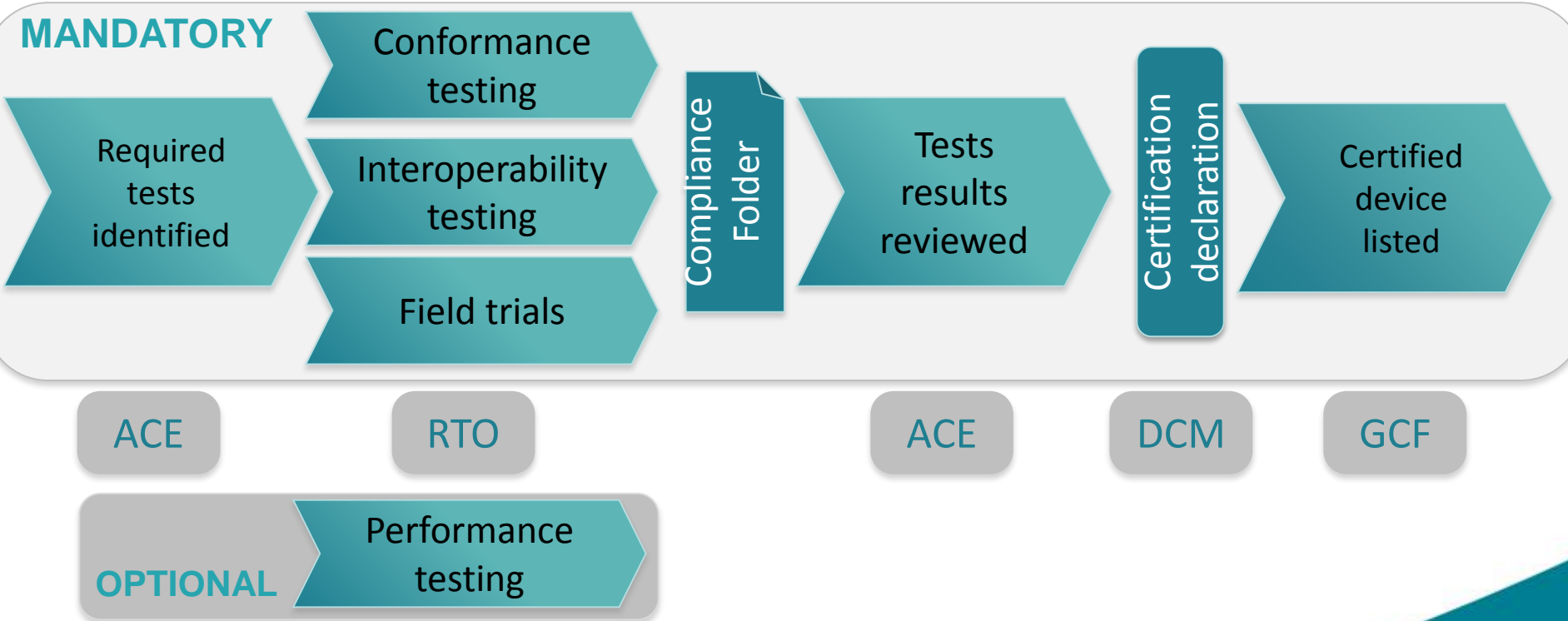
# The GCF Certification Process



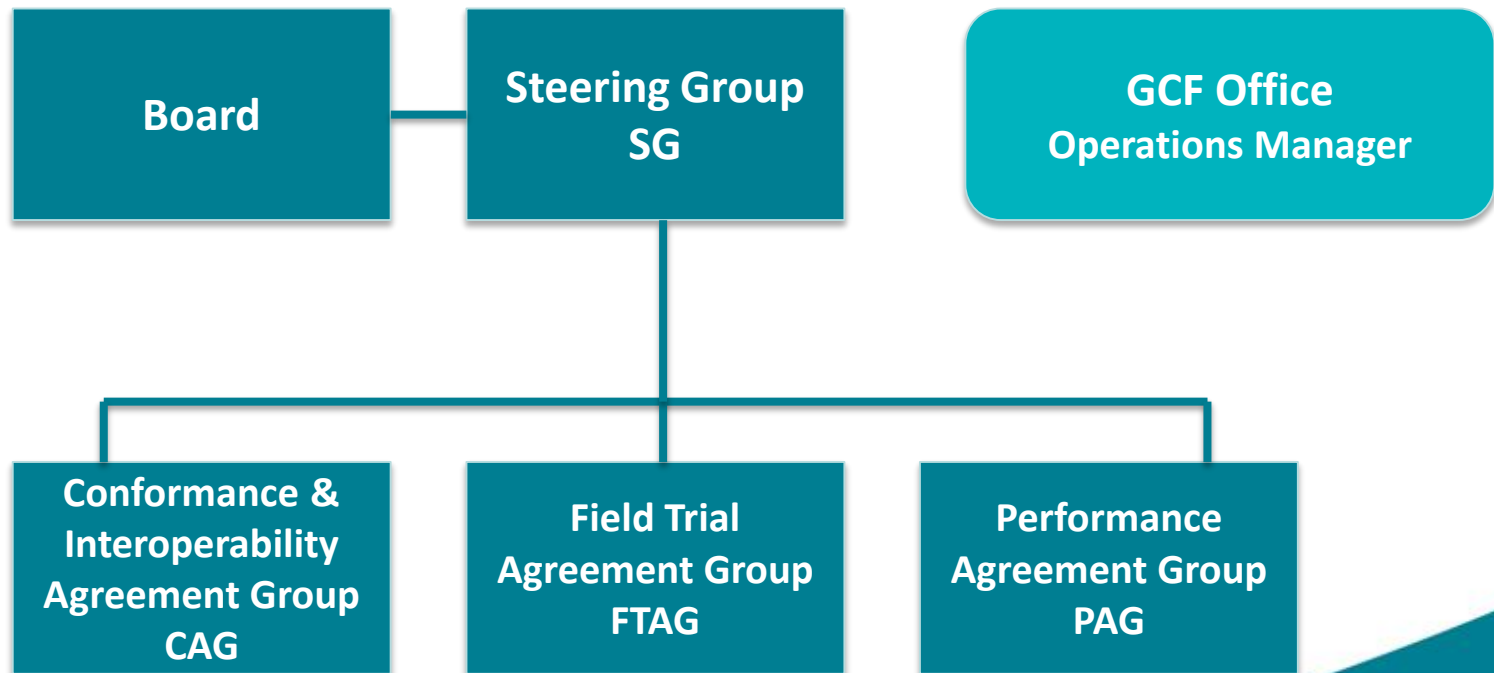
# Defining new certification criteria



# The GCF Certification Process



# GCF Structure



# What types of device can be certified?

Any wireless device	Incorporating	Any 3GPP/3GPP2 technology
Mobile/smartphone		GSM
USB modem		GPRS
Embedded module		EDGE
Data card		3G (UMTS/WCDMA/C2K)
Laptops & Notebooks		HSPA
Tablet		LTE (FDD, TDD)
M2M device		
Mobile gateway / hotspot		

*GCF Certification evolves in step with 3GPP technologies*

# Find out more

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