



Mobile Manufacturers
Forum

ITU-T Workshop on “Practical Measurement of EMF exposure”
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Specific Absorption Rate: How to explain, how to measure

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Mobile Manufacturers Forum (MMF)



Presentation Overview

1. Background to the MMF
2. Standards: International Developments
3. How to explain Specific Absorption Rate (SAR)
4. How to measure SAR
5. Summary

Background to the MMF

- International association of radio equipment manufacturers, founded 1998
 - Representing around 80% of global handset sales; and
 - The providers of the majority of global network infrastructure
- Association's focus:
 - Health and safety
- Key areas of activity:
 - Research and standards support
 - Regulatory harmonisation
 - Public communications

MMF Members

- Apple
- Cisco
- Ericsson
- Intel
- LG
- Motorola Mobility
- Motorola Solutions
- Nokia
- Nokia Siemens Networks
- Samsung
- Sony Ericsson
- TCT Mobile (Alcatel Mobile Phones)

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- **Science-based approach prevails** as countries around the world have adopted ICNIRP limits.
- Also ITU recommends:*
“**If such limits do not exist**, or if they do not cover the frequencies of interest, then **ICNIRP limits** (Appendix I) **should be used.**”

(*ITU-T K.52 (12/04) - Guidance on complying with limits for human exposure to electromagnetic fields), see also K.52 Corrigendum 1 (05/2009)



International developments

- Brazil:
 - Since **2002**, ICNIRP limits had been in force based on **Resolution # 303**, issued by Brazilian National Telecommunication Agency ANATEL.
 - **In May 2009**, ICNIRP's scientific rationale and limits stipulated by **federal law #11934/2009**.
 - The order applies to both **network infrastructure and handsets** well as all the other radio systems (TV broadcasting, radio broadcasting, two ways radios, etc)



International developments

- China:
 - In August 2008, China officially adopted ICNIRP based limits for handsets.
 - Limits for base stations are currently being prepared but MIIT has stated they see no reason for these limits not to be also based on ICNIRP.



International developments

- India:

- In **September 2008**, the Telecom Commission of India **formally adopted ICNIRP guidelines** in India.
- The order applies to both **network infrastructure and handsets**.
- India is **currently in the process of adopting exposure measurement standards** and is looking carefully at the existing European and international (IEC) standards.



International developments

- Russia:

- Russia's current **EMF limits** were **developed before mobile communications** was available. At that time the **rationale** for determining compliance was **completely different**.
- In **December 2008**, the Consumer Rights Protection Agency **Rospotrebnadzor**, endorsed **action plan designed to harmonize EMF standards** with those used internationally.



International developments

- Rwanda:
 - Since 2008, ITU-T 52K (EMF exposure guidelines based on ICNIRP) is in place.
 - The order applies to both **network infrastructure and handsets**.
 - Rwanda Utilities Regulatory Authority (RURA) started to establish a close working relationship with the National Environmental Management Authority (REMA) also in terms of EMF issues.



International developments

- Tanzania:
 - In Nov 2008, the Tanzania Atomic Energy Commission (TAEC) started an initiative to implement ICNIRP guidelines.
 - In Nov 2009, conference resolution to implement WHO-based EMF policy and ICNIRP limits in the East African Community.
 - In Sept 2010, TCRA* issued public notice to endorse ITU/ICNIRP limits and in Nov 2010, practical workshop on RF measurement (base stations). *Tanzania Communications Regulatory Authority



International developments

- Zambia:
 - In **August 2007**, the Communications Authority Zambia adopted **ICNIRP limits**.*
 - In **2008/2009**, national baseline **survey** on more than 1,200 GSM and broadcasting transmitters **to assess EMF exposure** and compliance with EMF exposure limits.**
 - Followed by a comprehensive **awareness program explaining the results** and the future steps.**

*Source: ZM.S.102

**CAZ Regulatory Report 2009

- Conclusion:
 - Strong trend toward the adoption of ICNIRP based exposure limits
 - World's two most populated countries adopted ICNIRP based exposure limits
 - Those countries have reviewed and accepted the scientific rationale underpinning the ICNIRP approach.

Harmonization trend provides benefits

- Harmonization provides benefits for everyone:
 - Industry:
 - a **single standard** reduces the **costs** of production as mobiles are **designed once, tested once** and able to be **sold globally**
 - Consumers:
 - access to the **services and products available** elsewhere **around the globe**
 - mobile phone **prices decrease** further
 - Governments:
 - **high** levels of **protection** for all

Presentation Overview

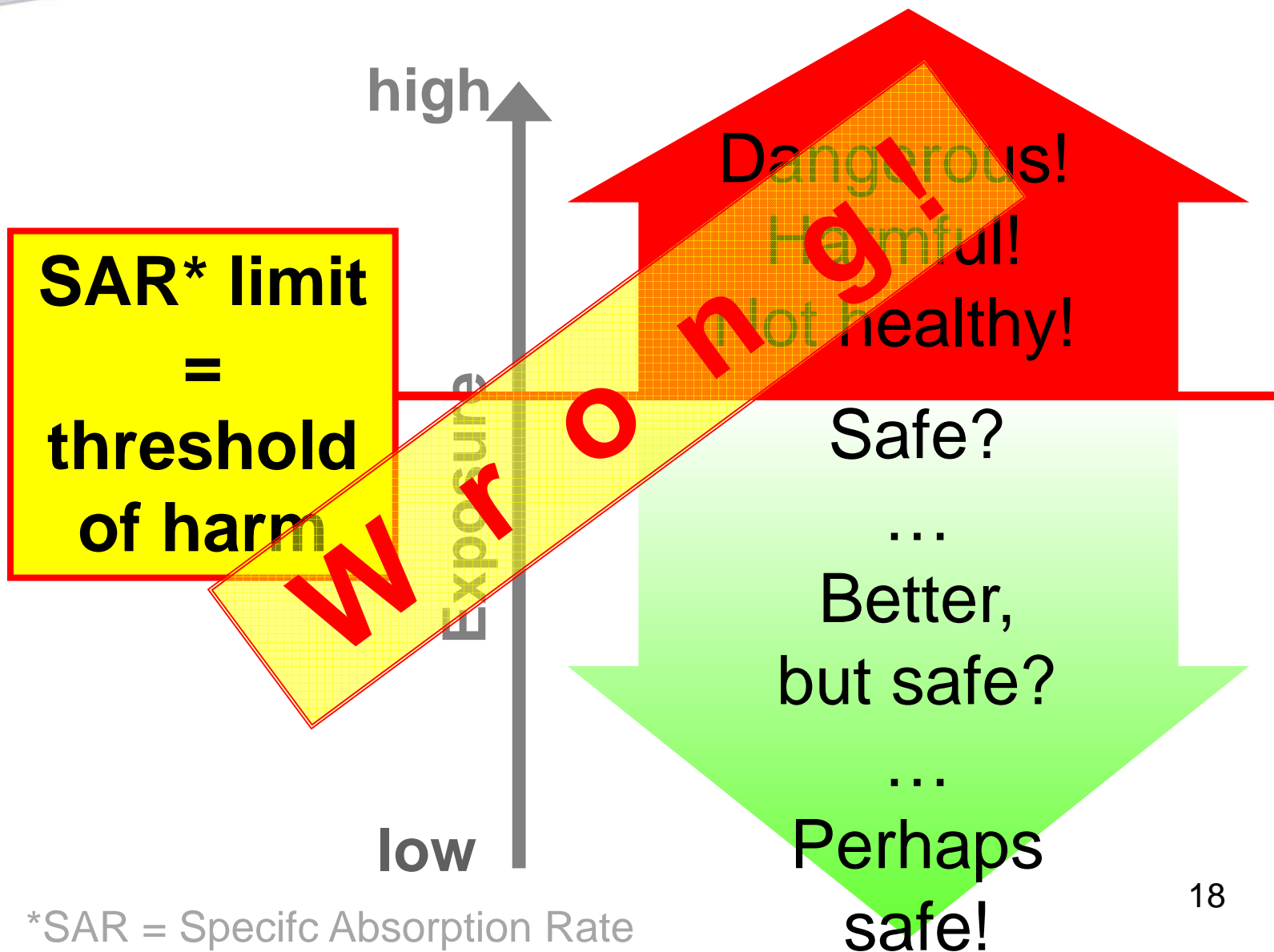
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ICNIRP exposure limits: mobile phones

Exposure Characteristic	ICNIRP limits		
	Whole Body averaged Specific Absorption Rate	Local SAR averaged over 10 g of tissue	
		Head & Trunk	Limbs
Workers' exposure	0.4 W/kg	10 W/kg	20 W/kg
General Public exposure	0.08 W/kg	2 W/kg	4 W/kg

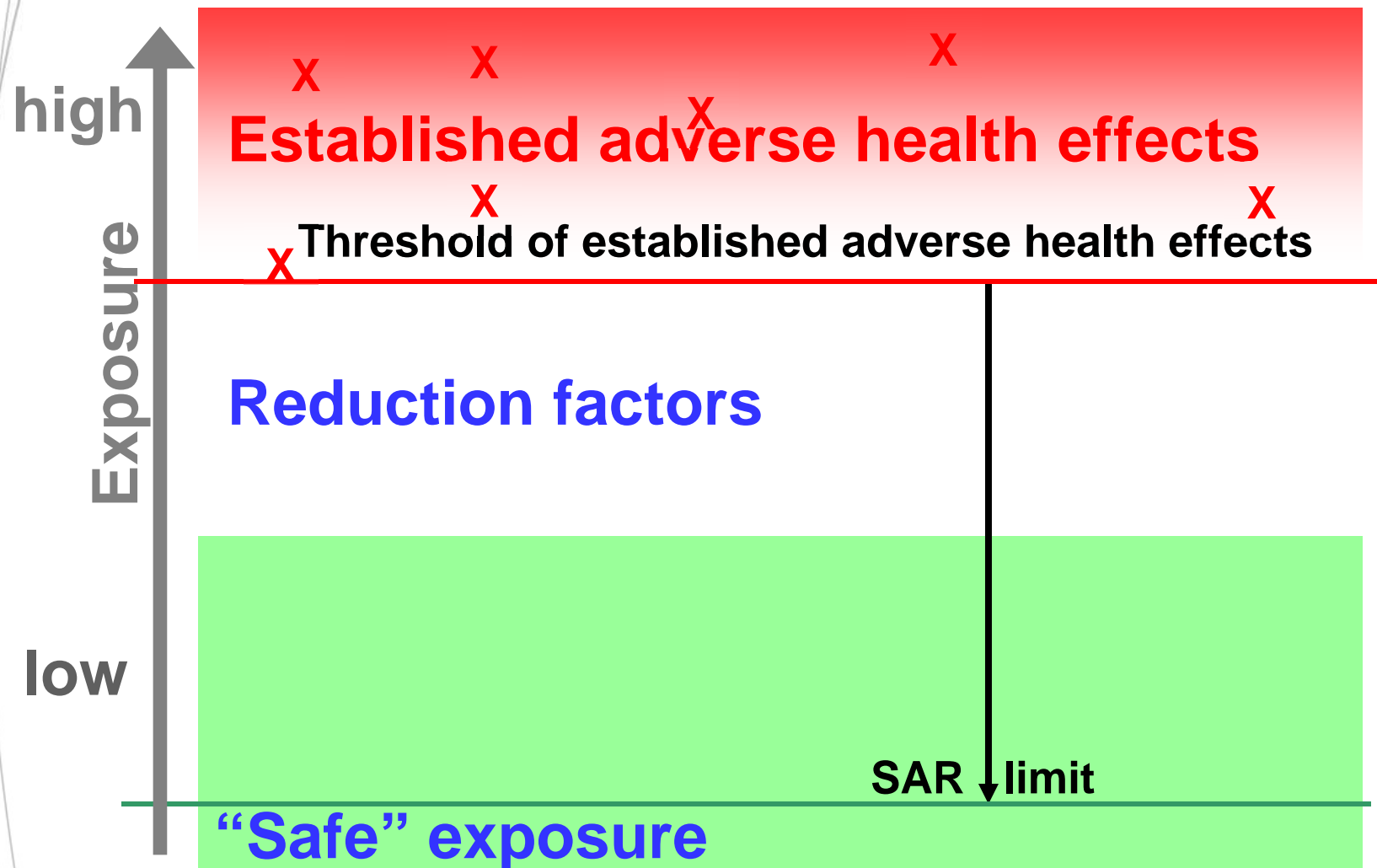
Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz).” Health Physics, April 1998, vol.74, number 4, pp. 494-522

Misinterpretation of SAR* limit (2 W/kg)



*SAR = Specific Absorption Rate

SAR* limit (2 W/kg) correctly explained



*SAR = Specific Absorption Rate

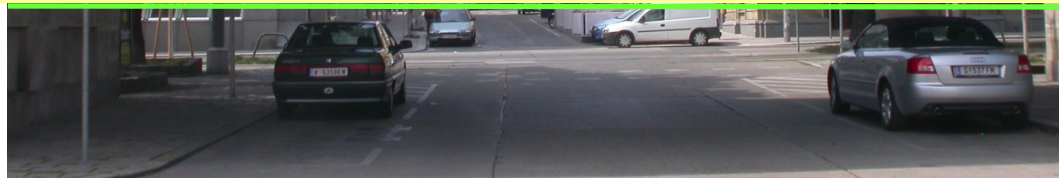
Explaining SAR: Metaphor 'Bridge'

Clearance = threshold of established adverse health effects

Maximum permissible height = SAR limit



...but to show
the right proportions you will need ...



Explaining SAR: Metaphor 'Bridge'

Threshold of established adverse health effects

Occupational SAR limit for
head and trunk: 10 W/kg

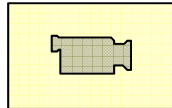
Public SAR limit for
head and trunk: 2 W/kg

All mobile phones below 2 W/kg are equally safe.

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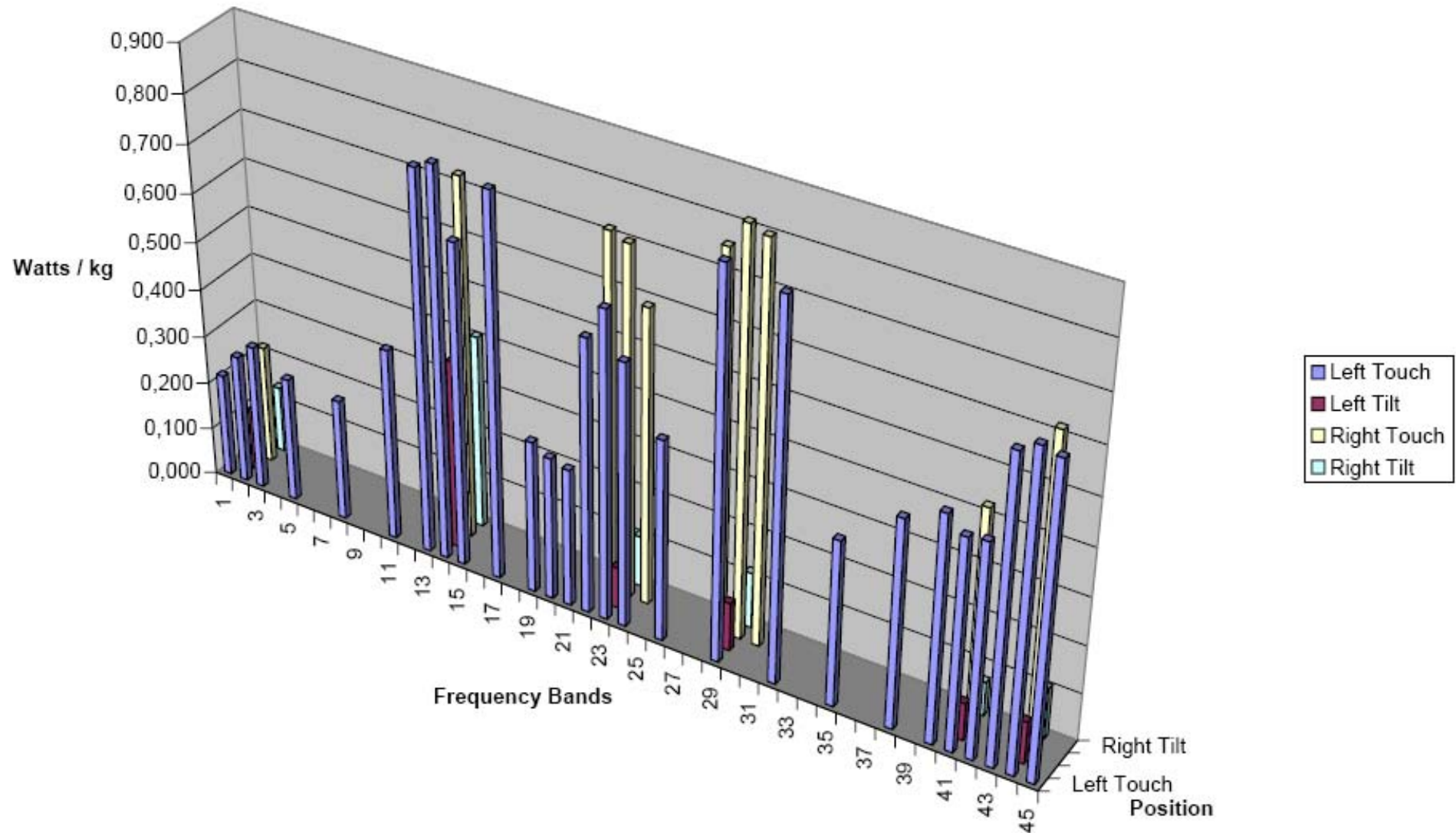
SAR compliance testing

- 2 measurement standards in place:
 - IEC 62209-1 (head)
 - IEC 62209-2 (body-worn, separation distance of up to 25 mm can apply)
- Mobile phones are **tested** for compliance **at the highest possible power level.**
- Video on SAR testing: 

- Get more detailed information on SAR:
www.emfexplained.info/?ID=24898

Test at highest possible power level and report highest SAR value in user manual

SAR values of GPRS multi-band mobile phone



Adaptive Power Control...

- ... ensures that mobiles only operate on the minimum power needed to make or maintain a call and ...
- ... reduces EMF exposure further.



User preference

If people are **still concerned** about EMF exposure, they can reduce exposure to mobile phone signals by using a **hands-free device**.

- **Important:** The suggestion to use of a hands-free device is to reduce concerns. It's not about additional or higher safety as **all compliant mobile phones are equally safe**.

What one should know about mobile phones and low SAR value

- Many people mistakenly assume that using a cell phone with a lower reported SAR value necessarily decreases a user's exposure to RF emissions...
- ...a single SAR value does not provide sufficient information about the amount of RF exposure under typical usage conditions to reliably compare individual cell phone models.

Summary

- No variations in safety under the strict limits developed by ICNIRP.
- ICNIRP has been recommended by ITU and World Health Organization.
- The available scientific evidence provides sound basis for confidence in the safety of the technology.
- Research (in particular into long-term heavy use) continues to strengthen the scientific basis further.

Thank you for your attention. Questions? Further Information needed?



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MMF's Director for Europe, Middle East and Africa and responsible for the co-ordination of the association's activities in the region. Prior to joining the MMF:

2000 – 2006: Managing Director, Austrian Forum
Mobilkommunikation (national trade organisation)

1990 – 1999: Member of the Austrian Parliament, focused on
infrastructure issues, telecommunication and environment

He graduated as Master of Laws at the University of Graz,
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