DMR

DIGITAL MOBILE RADIO ASSOCIATION

DMR Technology and Deployment Case Studies

IWCE

Connecting Critical Communications

Las Vegas, 28th September 2021

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WHY DMR?

Modern – Digital - Future proof – High Performance – Feature Rich - Highly Spectrum Efficient – Fits in existing Analogue Licencing - Secure – Value for money

And for the Accountants/Shareholders – Low Risk of ownership

How?

ETSI DMR – Competition and Risk

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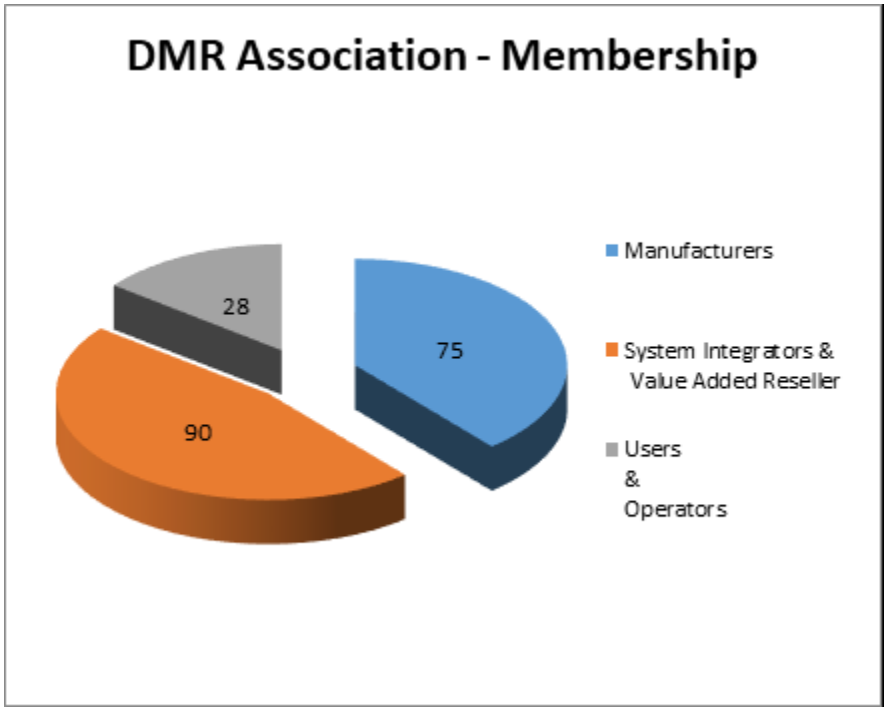
DMR DIGITAL MOBILE RADIO ASSOCIATION

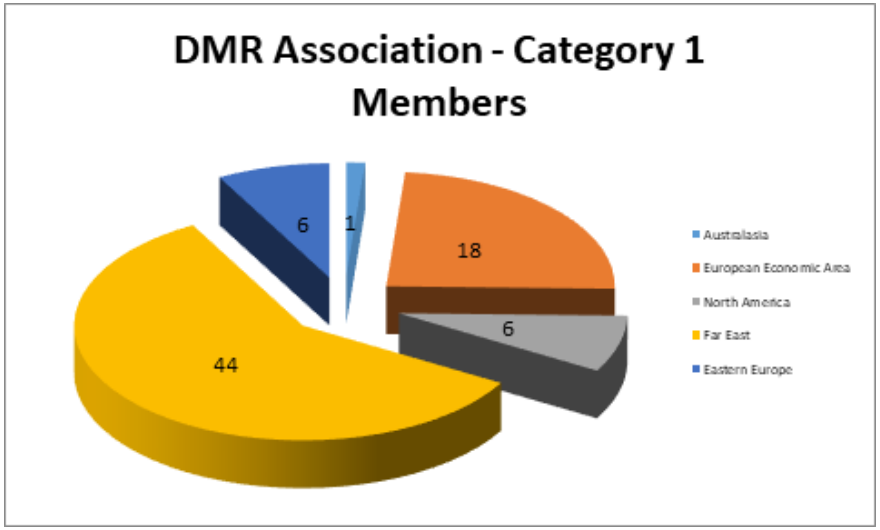
How many Manufactures offer DMR and want your business?

ETSI DMR Manufacturers



Total of 193 Members.

75 of them are Manufacturers (Category 1).



The DMR Association: Benefits

21st century digital radio standard

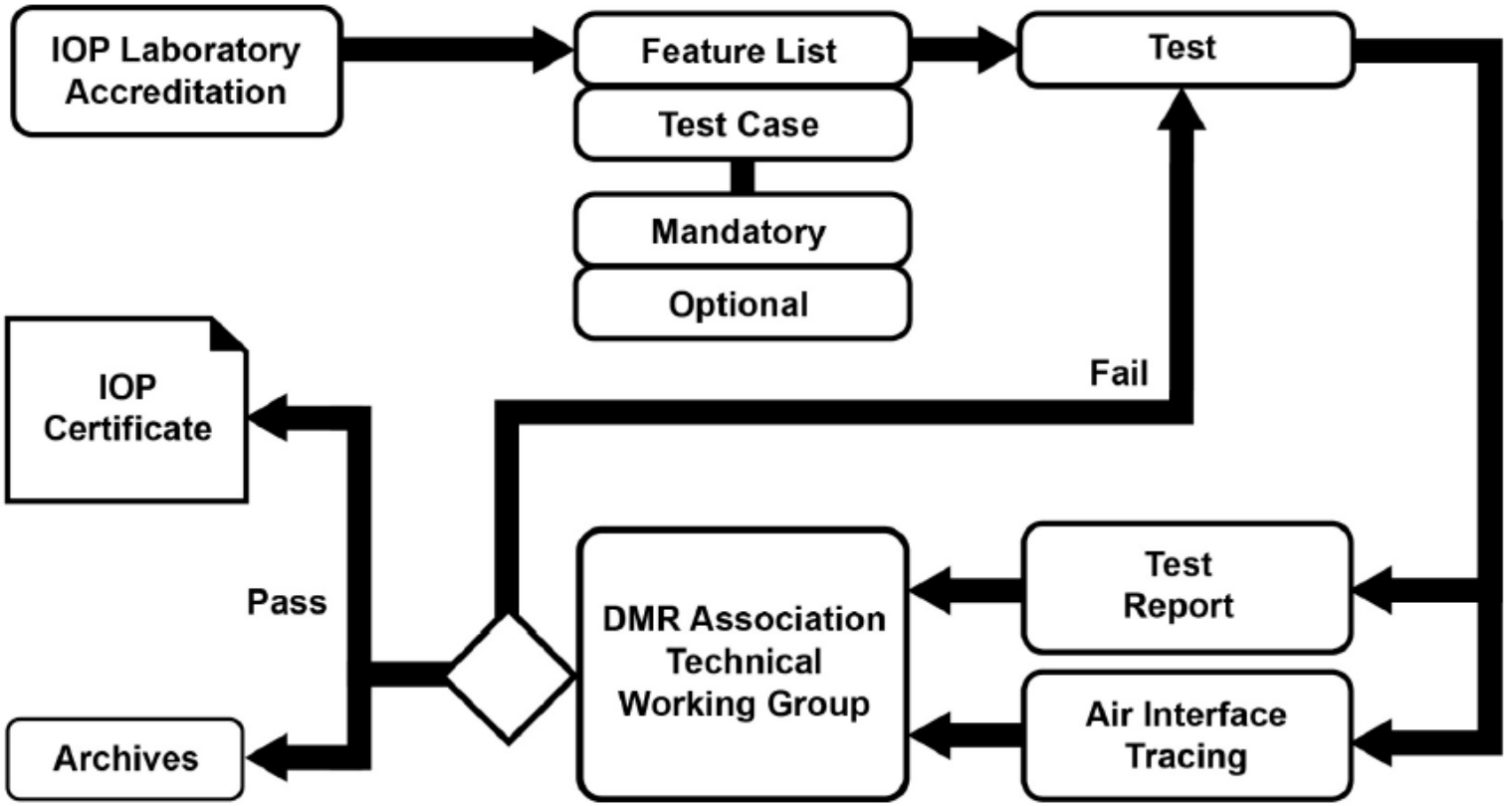
- We work with our members, worldwide, to ensure that DMR Digital Mobile Radio is the most widely supported digital business radio standard
- Our members are companies, organisations and individuals who use or build DMR products professionally or those working to support the DMR standard in other ways
- By using a combination of education, awareness, certification and interoperability training we operate to make sure that business buyers of today's digital radio technology have the security of knowing that they are investing in the future
- We're here to ensure that DMR products exist within a successful, open, multi-vendor chain

The DMR Association: Mission and Objectives

For DMR we do:

- Operate an equipment interoperability testing and certification program
- Communicate with the user community to capture new requirements
- Enhance the feature set of DMR with new functions.
- Offer education and updates about the standard
- Give advice to regulators to ascertain an environment in which the technology can flourish

The DMR Association: The Interoperability Process



The DMR Association: The Interoperability Test Cases

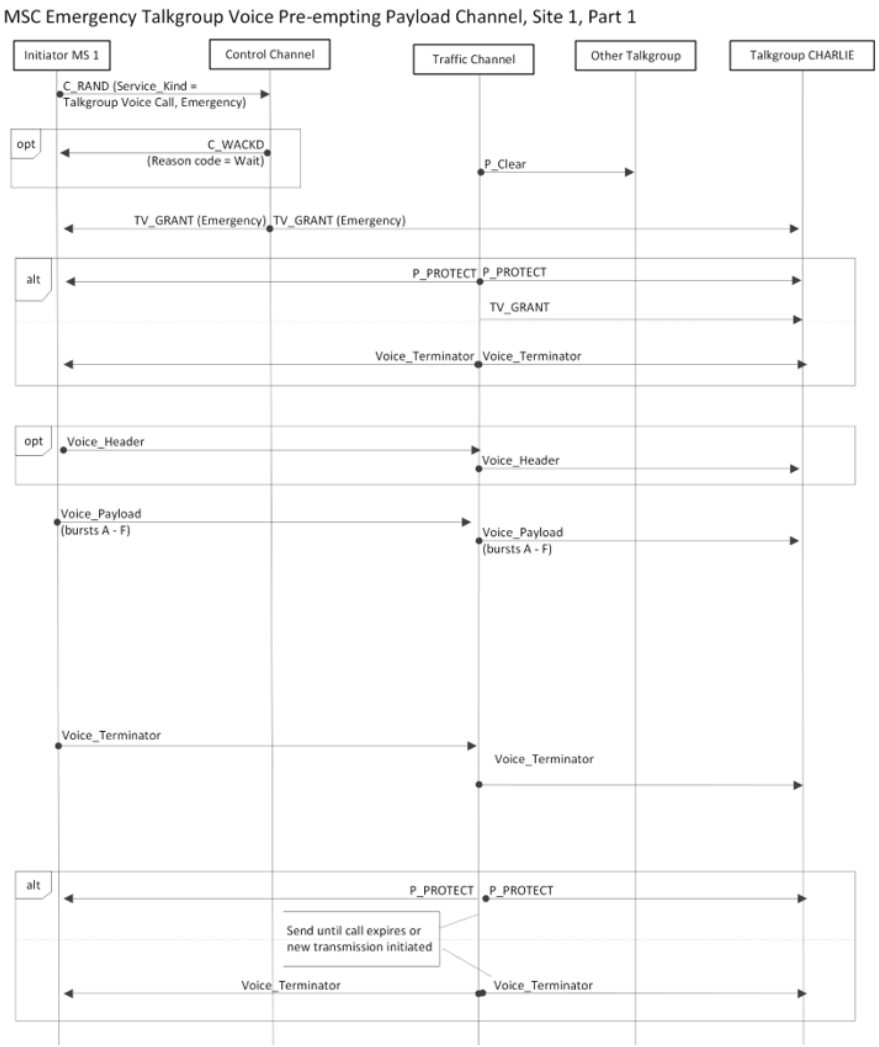
Test case 4: Emergency Pre-Emption of Payload Channel with Reverse Channel Signalling. Multi-Site

Test case id: @IOP_T3_Emergency_PreEmption_PayloadChan_RevChanSig

Procedure

1) Set-up the trunking system so that on Site 1 only one control channel and two payload channels on a separate frequency pair are available. Also ensure that at least two payload channels are available on Site 2. This can be either achieved by the system restricting access to certain channels or "occupying" the channel by a mobile that is not part of the actual test setup.
2) Set up a group call on MS 6 to talkgroup ECHO and initiate a transmission
3) Set up a group call on MS 4 to talkgroup DELTA and initiate a transmission
4) Confirm that MS 5 can hear and clearly understand MS4's transmission. MS 1, MS 2 and MS 3 can not hear MS 4's transmission.
5) End talking on MS 4.
6) While no MS is transmitting in the call from MS 6 to talkgroup ECHO and no MS is transmitting in the call from MS 4 to talkgroup DELTA, initiate an emergency group call from MS 1 to Talkgroup CHARLIE.
7) **Pass Criterion:** The manufacturer specific information on the radios shows that one of the normal calls on Site 1 has been ended.
8) **Pass Criterion:** The manufacturer specific information on MS 1 shows that the emergency call has successfully been set up
9) **Pass Criterion:** Confirm that MS 2 and 3 can hear and clearly understand MS 1's transmission.
10) End the call from MS 1.
11) **Pass Criterion:** The manufacturer specific information on MS 1 shows that the call has ended and has left the payload channel and that the trunked system releases the payload channel resource.

The DMR Association: The Interoperability Test Cases



The DMR Association: The Interoperability Air I/F Tracing

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No.     Time           Source                Destination           Protocol Length Info
     65 9.539188000    192.168.0.1           192.168.0.100         DMR      86     INBOUND  - CSBK - C_RAND: GRP_V_SRV from 3

Frame 65: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface 0
Ethernet II, Src: Prod-El_00:23:6a (00:16:64:00:23:6a), Dst: 38:63:bb:b9:37:c7 (38:63:bb:b9:37:c7)
Internet Protocol Version 4, Src: 192.168.0.1 (192.168.0.1), Dst: 192.168.0.100 (192.168.0.100)
User Datagram Protocol, Src Port: scp-config (10001), Dst Port: scp-config (10001)
Digital Mobile Radio Protocol (DMR),   Tracer Release: Selex-ES Tracer 2 (PAT2)
    Time Stamp Packet : 9628590 cells (1203573,750000 ms)
    DMR Time since beginning of capture: 9540,000
    Physical Layer     (Layer 1),   Channel: Inbound Data
    Data Link Layer    (Layer 2),   Burst Type: CSBK
        Color Code: 0
        Payload after BPTC (196,96) Decoding: 9f 00 00 01 00 00 03 00 00 03 6f 97
        Last Block (LB): 1 - Protect Flag (PF): 0 - Manufacturers Feature ID (MFID): 00
        Checksum: CRC 16 - CCITT, (0x6f97) [correct]
    Call Control Layer (Layer 3)
        Tier III PDU type: C_RAND (Random Access Request)
        Service_Kind: 0x1 (GRP_V_SRV - Talkgroup Voice Call Service)
        Service_Options: 0x00
                EMERG: 0 (Non-emergency service)
                PRIVACY: 0 (Text/Voice plain)
                SUPED_SV: 0 (No Supplementary_user data Transfer Service required for this call)
                BCAST_SV: 0 (Non-broadcast service)
                OVCM_SV: 0 (Non-OVCM call)
                PRIORTY_SV: 0 (Normal -low- priority)
        Proxy Flag (PROXY): 0 (Number of Extended BCD digits for addressing through a gateway = 1 to 20)
        Appended Supplementary_Data (SUPED_VAL): 0 (Number of appended UDTs required to transport supplementary_user data)
        Ambient Listening Service (ALS_SERV): 0 (Ambient Listening Service not requested)
        Target_address: 3 [0x000003]
        Source_address: 3 [0x000003]
    Common Announcement Channel (CACH)
        TDMA Channel: TS1
        Inbound Signal (MS Sourced): No more CACH Information
```

The DMR Association Relationship with ETSI

The signatories:

ETSI (The European Telecommunications Standards Institute) produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, broadcast and Internet technologies. Our standards enable the technologies on which business and society rely. ETSI is an industry-led standards development organization with a membership of over 850 manufacturers, network operators, service providers, research bodies, regulatory bodies and universities from 65 countries. ETSI aims to produce globally applicable standards and is officially recognized by the European Union as a European Standardization Organization.

The Digital Mobile Radio Association (**DMR Association**) is a global non profit industry association dedicated to promote the success of DMR technology by removing barriers to interoperability and supporting innovation and adoption of DMR. The Association is operating an interoperability testing and certification program to guarantee a genuine multi-vendor market for DMR equipment. By using a combination of education, awareness, certification and interoperability training, the Association operates to make sure that business buyers of today's digital radio technology have the security of knowing that they are investing in the future.

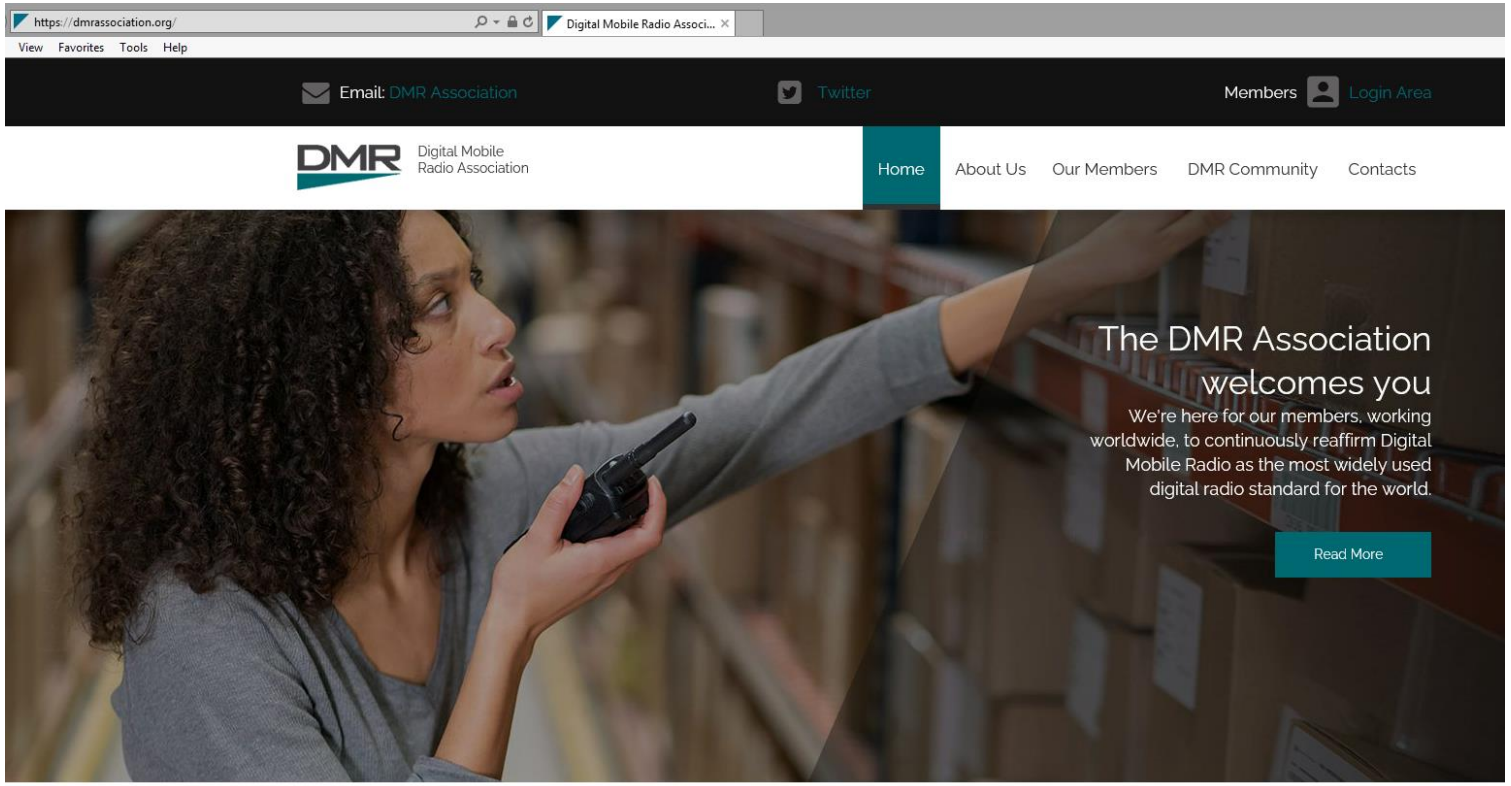
Overall objective:

ETSI and the **DMR Association** have the common objective to perform and promote, directly or indirectly, regional and international standardization with the aim of contributing to the establishment of a global information infrastructure.

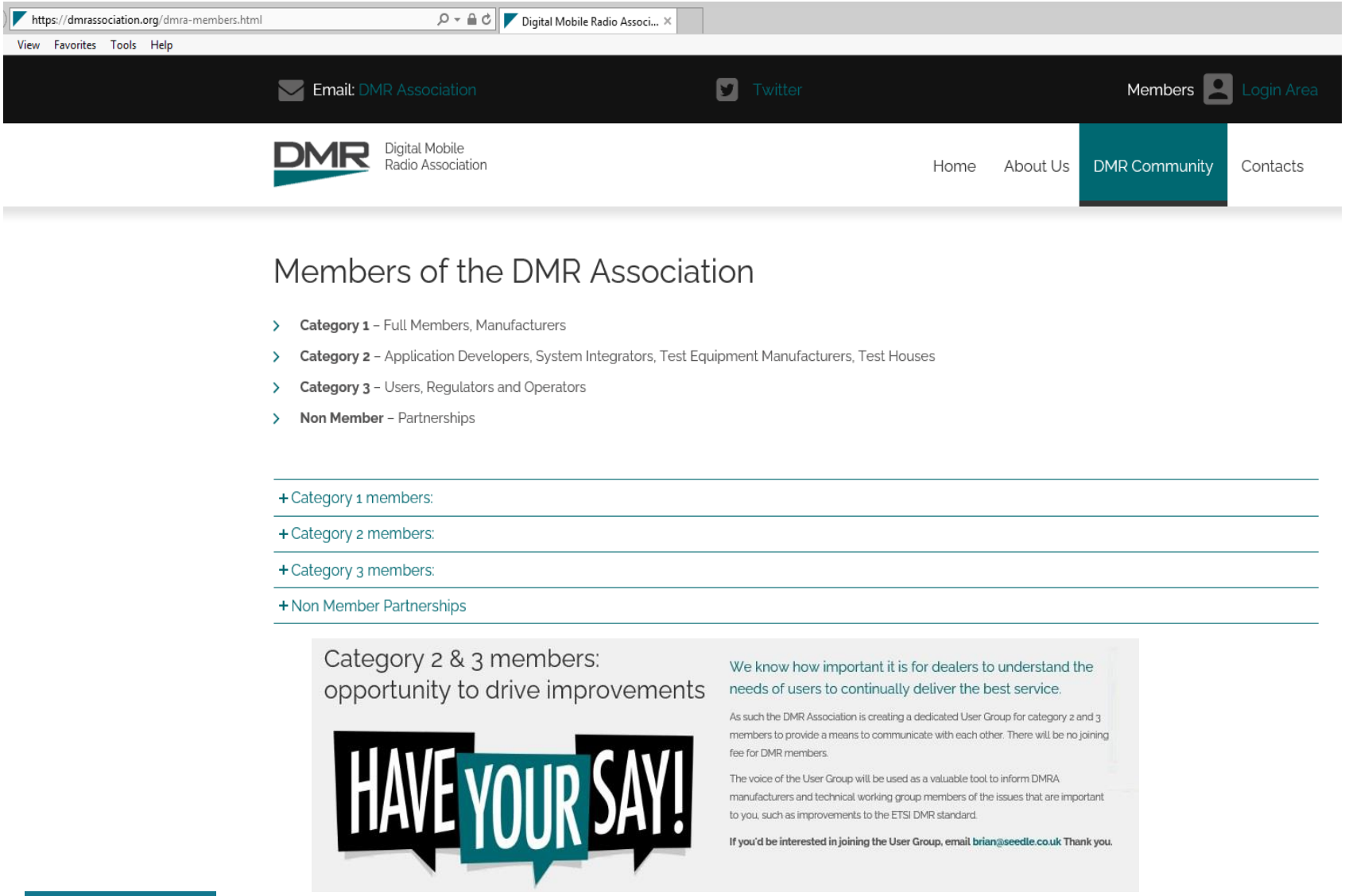
ETSI and the **DMR Association** co-operate in the area of digital mobile radio systems and work together for their mutual benefit. Furthermore the parties may seek to encourage and develop collaborative activities in various ways, including the exchange of ideas and expertise in relation to the European Union's policy towards standardization in general.

ETSI and the **DMR Association** have noted the necessity of structuring and strengthening their relationship and fostering a closer co-operation.

The DMR Association: Website



The DMR Association: Website - Members



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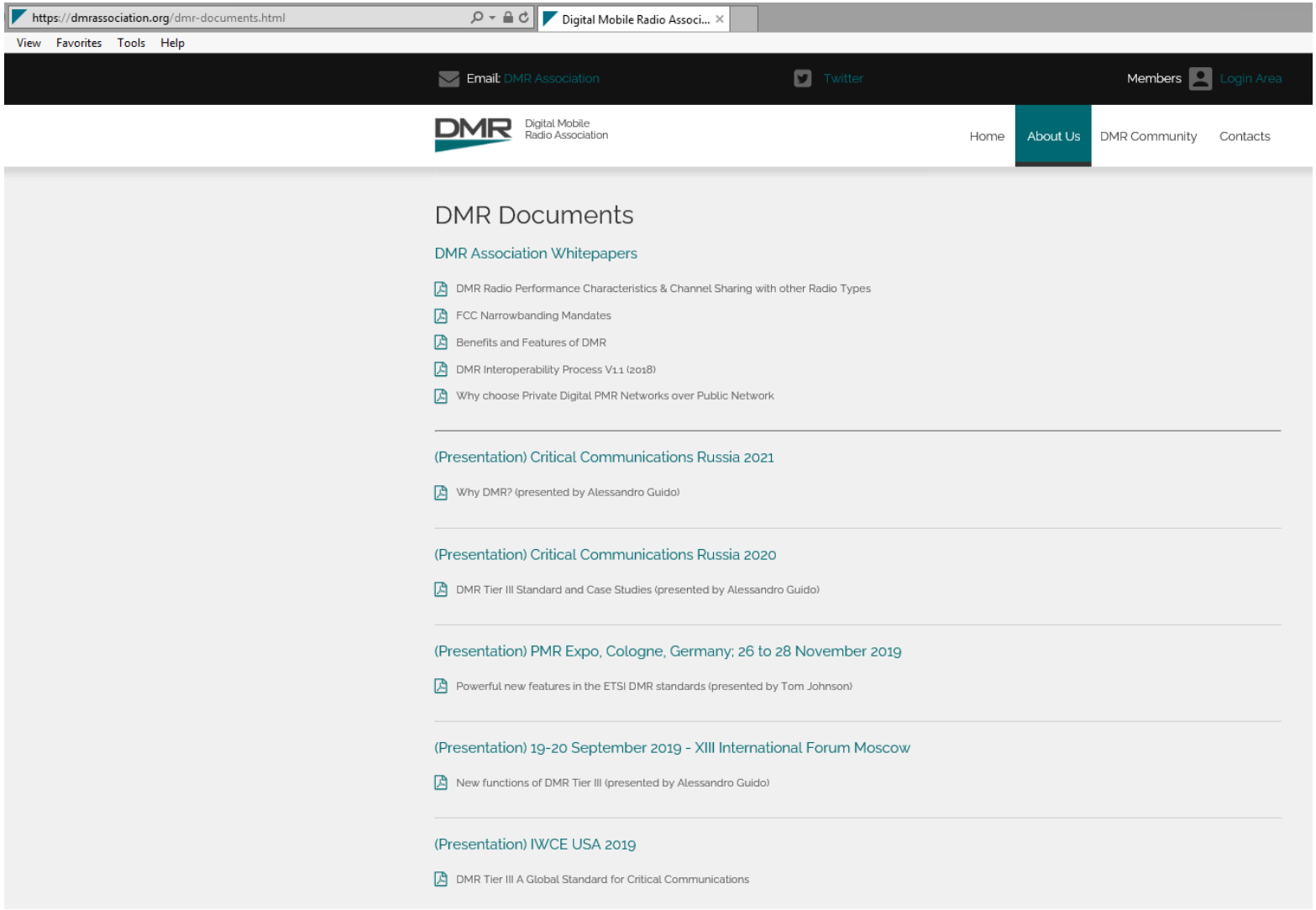
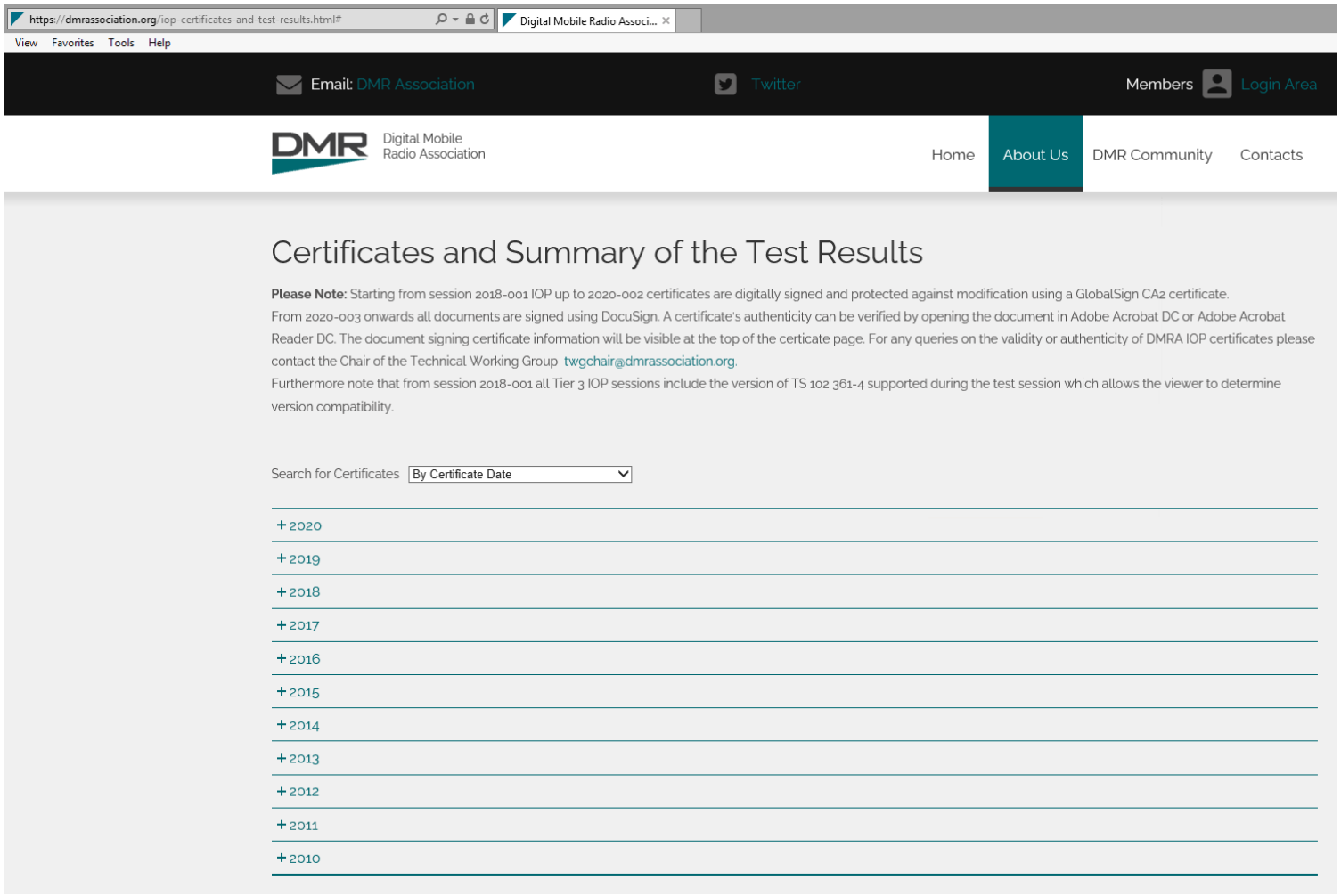
The DMR Association: Website Documents



The DMR Association: Website – IOP Certificates



The DMR Association: Website Sections Visits

What pages do user visit?

Page	Page Views
/	3,749
/dmr-standards.html	1,378
/dmra-members.html	1,018
/product-showcase.html	772
/index.html	770
/dmr-key-benefits.html	409
/dmr-documents.html	333
/iop-certificates-and-test-results.html	329
/about-dmra.html	290
/dmr-iop-certification.html	231

Last 90 days

The DMR Association: Geographical Areas of Website Visitors

Visits by Countries

1.	United States	**867** (23.37%)
2.	China	**512** (13.80%)
3.	India	**448** (12.08%)
4.	Russia	**174** (4.69%)
5.	United Kingdom	**115** (3.10%)
6.	Japan	**103** (2.78%)
7.	Germany	**93** (2.51%)
8.	Indonesia	**72** (1.94%)
9.	Italy	**61** (1.64%)
10.	Brazil	**60** (1.62%)

Last 90 days

ETSI DMR Fundemental Motives

Interoperability with a wide choice of manufacturers

Mature and Global Presence – 15 million users

Fits in existing narrow band licenced channels. 2 in 12½kHz

High performance with value for money

Voice security built in

Proven by a huge catalogue of case studies

Thank You!

https://dmrassociation.org