Group of Administrative Co-operation
Under the Radio Equipment Directive

11th RED Market Surveillance
Campaign on Professional Mobile Radio

REPORT

ON THE 11TH JOINT CROSS-BORDER

RED MARKET SURVEILLANCE CAMPAIGN

(2020-2021)

PMR

Adopted by ADCO RED

on 19th October 2021

CONTENTS

EXECUTIVE SUMMARY

Licensed or licence-exempt professional/private mobile radio (PMR or PMR 446) represent an important group of radio products in the EU single market. National frequency allocation tables determine that the usage of PMR requires an individual licence. In contrast to PMR, the usage of PMR 446 is licence exempt. The Radio Equipment Directive (RED) provides a ruleset on information about the restrictions on putting into service or the requirements for authorisation of use and the information required to use the radio equipment in accordance with its intended use. Furthermore, the technical specifications of multiband radio equipment (VHF and UHF bands) are prone to technical non-compliances. Finally, the significant impact of e-commerce in general and growing on-line sales activities of individual resellers increase the risk that non-compliant products become available to end-users and/or they are badly informed about the licensing requirements in place.

Based on the above-mentioned, ADCO RED launched a campaign on PMR.

In summary, the results of this campaign showed that:

- With over four-fifths of the samples presenting at least a non-compliance to the provisions of the RED, the non-compliance rate in this sector is too high.
- Even though the information about the restrictions on putting into service or of requirements for authorisation of use is an administrative requirement, its omission in about one in two sampled PMR radio equipment may lead to interferences and the misuse can have legal consequences for the user.
- There are still difficulties in MSAs accessing the technical file which should be drawn by the manufacturer before placing its radio equipment on the market. In such cases, it is not clear if the technical file does not exist or if the technical file does exist and the manufacturer is not presenting it to the MSA which is requesting it.
- Some clarifications on specific issues are needed as e.g. CE marking in the battery compartment and the relationship between EC Decisions and ECC Decisions.
- MSAs are challenged and will be even more so in the future with requirements that cannot be checked without the support of the manufacturer and software which sets the radio equipment in a mode permitting its test and/or the retrieving of internal information with the risk of circumventions.

The above results were interesting but gave little insight into the causes of the significant non-compliance issues indicated, limiting the conclusions that could be drawn from the results. The report therefore focuses on the analysis of statistics collected during the campaign showing the relative level of non-compliance with various requirements of the RED, without speculating on the causes of such non-compliances. However, a follow-up investigation into the causes could be very valuable for all involved parties (administrations, manufacturers, importers, distributors, users).

A. ELEMENTS OF THE CAMPAIGN

1. Reasons for the campaign

PMR is a product category that presumably represents a high risk of technical non-compliances. Over the last years MSAs have observed that the amount of non-compliances during market surveillance activities remained on a high level. It has been noticed that a continuously high number of equipment is placed on the European market (coming from both EU and third countries). Based on the figures on identified non-compliances an overview of the compliance level among Europe seems to be necessary. The information about license is crucial for the end-users. Therefore, the compliance with the formal and technical requirements needs an assessment.

2. Scope of the campaign

During the eleventh plenary meeting, the ADCO RED members agreed to launch a campaign on PMR limited to analogue or digital PMR and PMR 446 radio equipment. For this campaign PMR 446 radio equipment is equipment that is marketed as PMR 446. It was decided to exclude from the scope of the campaign: amateur PMR, maritime like PMR and SRD devices other than PMR 446.

The campaign had several goals among others:

- to check the compliance of PMR / PMR 446 radio equipment available within the EU market and to determine compliance level of these products;
- to verify if the PMR radio equipment category represents high risk of technical non-compliances;
- to check if the information on licence requirements is properly applied by the manufacturer and is in line with the national frequency regulations;
- to take appropriate actions to correct non-compliances;
- to propose further actions and recommendations.

The campaign was also intended to provide MSAs with the opportunity to participate in joint RED market surveillance action across EU and to improve the exchange of information between them. It was agreed that TCAM, EG RE, ECC, REDCA and ETSI would be informed of this campaign and its results.

3. Participation in the campaign

Participation in the campaign was voluntary and was open for all members of ADCO RED. Seventeen European countries participated in the campaign: Austria, Belgium, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden and Switzerland. Three of these countries due to the different circumstances could not perform technical tests until the end of the campaign and their participation in the campaign was limited to the assessment of administrative requirements.

4. Timing

The campaign started on the 1st January 2020. Due to the Covid-19 pandemic situation the information gathering, testing and data reporting phases of the campaign were prolonged, and campaign officially ended on the 30th April 2021. Within that period, MSAs carried out their activities on their own timescales. Participants were asked to upload their results to ICSMS database using the generic DRPI and to send dedicated DIFs to responsible persons for processing by mid-May.

5. Sampling

Participating MSAs took between 2 and 10 different PMR / PMR 446 radio equipment samples from their national market. Samples were chosen over the whole price range (up and down the market) and from all origins (EU, EEA, EFTA, and imported from third countries). The selection also included e-commerce investigations (like eBay, Amazon etc.). Within the campaign, correlation of non-compliances with price range and/or place of sampling was not investigated.

To avoid double sampling, participating MSAs were encouraged to register details of their selections of products to ICSMS as early in the campaign as possible. This way other participating countries could avoid picking the same products.

6. Documents

A Code of Practice has been developed with the aim of providing guidance and a common understanding of the purpose of the campaign and to ensure, if possible, the adaptation of harmonised practices during the operational phase of the campaign. The results of each assessment were recorded on a common electronic Data Input Form for the RED (RED DIF) and strictly dedicated for that campaign Data Input Form on Measurements (RED M-DIF).

7. PMR 446

A radio equipment is considered as PMR 446 radio equipment as soon as it complies with the technical specifications of PMR 446 as laid down in band no. 83 in the Commission Implementing Decision (EU) 2019/1345[1].

PMR 446 radio equipment is hand portable equipment (without base station or repeater use) carried on a person or manually operated, which uses integral antennas only in order to maximise sharing and minimise interference. PMR 446 equipment operates in short-range peer-to-peer mode and must not be used either as a part of an infrastructure network or as a repeater. It operates in the 446.0 MHz – 446.2 MHz with a maximum of 500 mW radiated power and requirements on techniques to access spectrum and mitigate interference apply.

PMR radio equipment may be operated on PMR 446 frequencies. Radio equipment which can be used both as PMR 446 and PMR is not considered as PMR 446 but as PMR. This has an impact on the information on the possible restrictions of use to be delivered to the user according article 10(10) RED.

8. Assessment procedure

Participating MSAs had to assess the product against determined administrative requirements paying attention to:

- product traceability and identification (name of the manufacturer and if applicable the importer; type designation, batch or serial number);
- CE marking on equipment and its packaging;
- involvement of a notified body in the conformity assessment process;
- description of intended use and information on restrictions of use;
- obligatory elements of EU-DoC or its short form and availability of the full EU-DoC;
- information on Standards applied by the manufacturer to show compliance with Article 3.2 of the RED (effective use of the spectrum);
- information about restrictions of use (if any) is in line with the national frequency regulation.

[1] Commission Implementing Decision (EU) 2019/1345 of 2 August 2019 amending Decision 2006/771/EC updating harmonised technical conditions in the area of radio spectrum use for short-range devices.

If the EU-DoC was not provided with the product, the participating MSA had to request it from the person responsible for placing the corresponding product on the market.

The participating MSAs had to request, as a minimum, the following elements of the technical documentation from the person responsible for the placing the assessed product on the market:

- test reports to demonstrate compliance with the requirement on effective use of spectrum (Article 3.2 of the RED);
- descriptions and explanations of the solutions adopted by the manufacturer to meet the essential requirements of the RED where Harmonised Standards have not been applied or they were used only partly;
- a copy of the EU-type examination certificate and its annexes as delivered by the notified body concerned and an adequate analysis and assessment of the risks where a conformity assessment according Annex III of the RED has been applied.

Participants of the campaign carried out measurements against the requirement in relation to the essential requirements as defined in the RED, in particular effective use of spectrum (Article 3.2 of the RED) by assessing the conformity with the applicable relevant Harmonised Standard. The results were compared directly with the limits of the Harmonised Standard, taking into account the ADCO RED position documents on measurement uncertainty and tolerances.

Measurements were carried out based on Harmonised Standards which have been indicated by the manufacturer, reflecting the moment when the product was placed on the market.

Table 1: List of Harmonised Standards	
PMR	
EN 300 086 V2.1.2	Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU
EN 300 113 V2.2.1	Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU
EN 300 219 V2.1.1	Land Mobile Service; Radio equipment transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU
PMR 446	
EN 300 296 V2.1.1	Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU

In cases where a previous version of the current Harmonised Standard was available at the moment of the product's placing on the market, then the measurements were carried out against the previous version. In cases where two (or more) Harmonised Standards could be applicable at the moment when the product was placed on the market, the measurements were carried out against the least stringent.

Results of the tests made were recorded on Data Input Form on Measurements (RED M-DIF) dedicated for the campaign and analysed from a statistical point of view.

B. RESULTS

Total number of the investigated products was eighty-nine (89). Analysis of the results was prepared in two perspectives: PMR vs. PMR 446 and device with integral antenna vs. device with antenna connector.

Table 2: investigated products	
Kind of product	Number of samples
PMR	31
PMR 446	58
Kind of antenna	Number of samples
Device with integral antenna	62
Device with antenna connector	27
Total number of samples	89

1. Administrative compliance

All samples were checked against administrative requirements of marking[2] and content of EU-DoC. Some elements of technical documentation of 56 samples (63% of the investigated products) were asked and 47 (53% of the requested technical documentation) received. In 9 cases (20%), the requested elements of the technical documentation were not received for the assessment.

Over two third of the checked products (70%) had administrative non-compliance within the meaning of RED.

Table 3: Administrative non-compliance of the checked products								
	Marking		EU-DoC		TD		**Overall**	
	Pcs	[%]	Pcs	[%]	Pcs	[%]	**Pcs**	**[%]**
Kind of product								
PMR[3]	27	87%	22	71%	15	68%	**28**	**90%**
PMR 446[4]	27	47%	21	36%	16	47%	**34**	**58%**
Kind of antenna								
Integral antenna[5]	31	50%	24	39%	19	51%	**38**	**61%**
Antenna connector[6]	23	85%	19	70%	12	63%	**24**	**89%**
Overall[7]	**54**	**61%**	**43**	**48%**	**31**	**55%**	**62**	**70%**

Due to the importance of frequency licensing issues related to PMR, participating MSAs paid special attention to the marking requirement for restriction of use. In 18 out of 31 cases the requirement was not fulfilled what means that in almost a quarter of checked products the information about the restrictions on putting into service or of requirements for authorisation of use is not provided in a proper way and isn't available to the end-users.

[2] 'marking' requirement consists of: traceability and identification marking; CE marking on equipment and its packaging; other information, incl. instruction, safety information, used frequency band(s), maximum output power, restriction of use and languages as determined.
[3] PMR: marking – 31 pcs checked, EU-DoC – 31 pcs checked, TD – 22 pcs checked, administrative – 31 pcs
[4] PMR 446: marking – 58 pcs checked, EU-DoC – 58 pcs checked, TD – 34 pcs checked, administrative – 58 pcs
[5] Integral antenna: marking – 62 pcs checked, EU-DoC – 62 pcs checked, TD – 37 pcs checked, adm. – 62 pcs
[6] Antenna connector: marking – 27 pcs checked, EU-DoC – 27 pcs checked, TD – 19 pcs checked, adm. – 27 pcs
[7] overall: marking – 89 pcs checked, EU-DoC – 89 pcs checked, TD – 56 pcs checked, administrative – 89 pcs

Seventy-one (71) samples had the CE-mark affixed only in the battery compartment. Even though this does not comply with general requirements for CE marking laid down in the legislation, because this possibility was offered in the R&TTE Guide for the R&TTED, some MSA's didn't consider it as a non-compliance. This issue has to be clarified for stakeholders and MSA's.

2. Technical compliance

Fourteen of seventeen participating MSAs (Austria, Belgium, Finland, France, Germany, Greece, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Sweden, and Switzerland) conducted a technical assessment of the chosen PMR / PMR 446 radio equipment. Seventy-three (73) products were checked against some requirements of the effective use of the spectrum (Article 3.2 of the RED). Samples were measured according to the Harmonised Standards indicated by manufacturers in the EU-DoC.

Table 4 presents the level of non-compliance in relation to kind of product and kind of antenna.

Table 4: Technical non-compliance of tested products

Kind of product	Non-compliant samples		Tested samples
PMR	12	55%	22
PMR 446	21	41%	51
Kind of antenna	Non-compliant samples		Tested samples
Device with integral antenna	23	43%	54
Device with antenna connector	10	53%	19
Total number of samples	33	45%	73

The 73 tested samples were grouped by the applied Harmonised Standard. Two PMR radio equipment samples were tested according to EN 300 296 V2.1.1 which relates to radio equipment using integral antennas and on the other hand different two PMR 446 radio equipment samples were tested according to EN 300 086 V2.1.2 which relates to PMR radios. Detailed results are presented in Table 5.

Table 5: Non-compliance of tested products vs Harmonised Standard

PMR	Non-compliant samples		Tested samples
EN 300 086 V2.1.2	8	62%	13
EN 300 113 V2.2.1	1	20%	5
EN 300 219 V2.1.1	2	100%	2
EN 300 296 V2.1.1	1	50%	2
Total number of samples	12	55%	22
PMR 446	Non-compliant samples		Tested samples
EN 300 086 V2.1.2	1	50%	2
EN 300 296 V2.1.1	20	41%	49
Total number of samples	21	41%	51

Detailed information on the reasons for technical non-compliance was gathered in the dedicated annex (RED M-DIF). Results of specifically tested radio-related characteristics were grouped into transmitter and receiver sides. Table 6 presents only failed phenomena in relation to Harmonised Standards used during tests.

Table 6: Analysis of technical non-compliance

	Harmonised Standard							
	EN 300 113 V2.2.1		EN 300 086 V2.1.2		EN 300 219 V2.1.1		EN 300 296 V2.1.1	
	Pcs	%	Pcs	%	Pcs	%	Pcs	%
Transmitter noncompliance								
Transmitter power (conducted)[8]			3	23	1	100		
Transmitter effective radiated power[9]							11	22
Transmitter unwanted emissions in the spurious domain[10]			7	50			10	26
Transmitter adjacent and alternate channel power[11]			2	20	1	50	1	3
Transmitter frequency deviation[12]			1	17			1	6
Transmitter frequency error[13]	1	20					3	9
Transmitter maximum transmit time[14]							4	25
Transmitter intermodulation attenuation[15]	1	25						
Receiver noncompliance								
Receiver spurious radiations[16]			2	15			9	22
Receiver blocking or desensitization[17]			4	57			4	36
Receiver spurious response rejection[18]			2	50	1	100	2	67
Receiver inter-modulation response rejection[19]			4	57			1	13
Overall	**1**	**20**	**9**	**60**	**2**	**100**	**21**	**41**

[8] EN 300 086 V2.1.2 – 13 pcs checked, EN 300 219 V2.1.1 – 1 pc checked
[9] EN 300 296 V2.1.1 – 51 pcs checked
[10] EN 300 086 V2.1.2 – 14 pcs checked, EN 300 296 V2.1.1 – 38 pcs checked
[11] EN 300 086 V2.1.2 – 10 pcs checked, EN 300 219 V2.1.1 – 2 pcs checked, EN 300 296 V2.1.1 – 32 pcs checked
[12] EN 300 086 V2.1.2 – 6 pcs checked, EN 300 296 V2.1.1 – 17 pcs checked
[13] EN 300 113 V2.2.1 – 5 pcs checked, EN 300 296 V2.1.1 – 34 pcs checked
[14] EN 300 296 V2.1.1 – 16 pcs checked
[15] EN 300 113 V2.2.1 – 4 pcs checked
[16] EN 300 086 V2.1.2 – 13 pcs checked, EN 300 296 V2.1.1 – 41 pcs checked
[17] EN 300 086 V2.1.2 – 7 pcs checked, EN 300 296 V2.1.1 – 11 pcs checked
[18] EN 300 086 V2.1.2 – 4 pcs checked, EN 300 219 V2.1.1 – 1 pc checked, EN 300 296 V2.1.1 – 3 pcs checked
[19] EN 300 086 V2.1.2 – 7 pcs checked

3. Overall compliance

From the group of eighty-nine (89) samples of PMR and PM446 radio equipment assessed by participating MSAs, seventy-four (74) products (83%) were found non-compliant with the requirements of the RED. Detailed statistical information is presented in Table 7. The results on Art. 3.2 non-compliances contained in this table have slight differences from tables 4, 5 & 6 due to some incomplete sets of results.

Table 7: Overall non-compliance

Group of products	Quantity	Administratively non-compliant	Art. 3.2 non-compliant	Overall non-compliant	Overall non –compliance [%]
Kind of product					
PMR	31	28	11[20]	29	**94%**
PMR 446	58	34	20[21]	45	**78%**
Kind of antenna					
Device with integral antenna	62	38	22[22]	49	**79%**
Device with antenna connector	27	24	9[23]	25	**93%**
Overall	**89**	**62**	**31[24]**	**74**	**83%**
Overall [%]	**-**	**70%**	**40%**	**-**	**-**

C. SPECIFIC ISSUES DISCOVERED DURING THE CAMPAIGN

1. Difficulties in testing

MSAs would like to be able to assess the compliance of the sampled radio equipment in an independent way which means without the necessity of involving the manufacturer. This campaign showed that this may become more and more difficult, not only for PMR radio equipment but for radio equipment in general.

For digital transmission, for the measurement of some receiver parameters, e.g. sensitivity, there is a need to access to the BER (Bit Error Ratio). This parameter is not available in a normal operation mode. Its measurement needs the support of the manufacturer, which has to put the radio equipment in a test mode not accessible for the users. This is the case for e.g. digital PMR radio equipment.

[20] PMR: Art. 3.2 – 21 pcs checked
[21] PMR 446: Art. 3.2 – 56 pcs checked
[22] Device with integral antenna: Art. 3.2 – 59 pcs checked
[23] Device with antenna connector: Art. 3.2 – 18 pcs checked
[24] Overall: Art. 3.2 – 77 pcs checked

D. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

- The level of non-compliances is too high for PMR and PMR 446 radio equipment.
- Over four fifths (83%) of the products did not comply with the requirements of the RED.
- Even if the level of administrative non-compliance (70%) is significantly higher than the level of technical non-compliance with the requirements of effective use of spectrum (40%), it should be noticed that not all the requirements were tested for sampled products.
- The highest level of administrative non-compliance was found against the marking requirement (61%).
- In one in two PMR radio equipment assessed, information about the restrictions on putting into service or of requirements for authorisation of use was not provided in a proper way and was not available to the end-users. So, the end-user may use the radio equipment in an appropriate way and create interferences to other users.
- The level of administrative non-compliance as well as technical non-compliance is higher for PMR (90% and 55%) in comparison to PMR 446 (58% and 41%) radio equipment.
- Almost all PMR 446 radio equipment checked have been assessed by the manufacturer on the basis of EN 300 296 (49 samples), two against EN 300 086 and one against EN 303 405 (with the involvement of a notified body).
- Three highest common technical non-compliance were assessed against:
    - Transmitter unwanted emissions in the spurious domain (33%);
    - Transmitter power (conducted or effective radiated) (23%);
    - Receiver spurious radiations (20%).
- During the campaign, it was noticed, that some responsible economic operators can't provide MSAs the requested elements of the TD, which shows that economic operators don't have sufficient knowledge of their obligations.

2. Recommendations and proposed actions

- The results of the campaign should be published via various communication channels widely throughout Europe. Publicity should target all economic operators in the area of the professional mobile radio industry in order to increase the level of compliance from the perspective of RED requirements.
- MSAs should take the results of this campaign into consideration when making their annual market surveillance plans as stated in the Regulation (EU) 2019/1020.
- MSAs should increase the usage of ICSMS for exchange of information.
- MSAs should check with their national radio regulators on how the Commission Implementing Decision (EU) 2019/1345 is implemented in the national frequency allocation plans.
- Manufacturers should pay more attention to the formal requirements of the RED.
- Commission should clarify the situation of CE marking affixed only in the battery compartment and communicate it to stakeholders and MSAs.
- ADCO RED suggests ECC to assess if DEC 15(05) needs a review regarding the reference to EN 303 405 which currently does not provide presumption of conformity with the essential requirements set out in the Article 3.2 of the RED.
- ADCO RED members active in ETSI should work on review EN 303 405 as the dedicated Harmonised Standard to fully cover for PMR 446 radio equipment.

E. ABBREVIATIONS

ADCO RED	Group of Administrative Cooperation for the sector of radio equipment
CIRCABC	Communication and Information Resource Centre for Administrations, Businesses and Citizens
DIF	Data Input Form
M-DIF	Data Input Form on Measurements
DRPI	Directive Related Product Information
EU	European Union
EU-DoC	EU Declaration of Conformity
ECC	Electronic Communications Committee
EEA	European Economic Area
EFTA	European Free Trade Association
EG RE	Expert Group on Radio Equipment
ETSI	European Telecommunications Standards Institute
ICSMS	Internet-based Information and Communication System for Europe wide cross-border Market Surveillance of technical products
MSA	Market Surveillance Authority
PMR	Professional/private mobile radio (PMR) person-to-person two-way radio voice communications system which use portable, mobile, base station, and dispatch console radios
RED	Radio Equipment Directive – Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
RED CA	Radio Equipment Directive Compliance Association
Regulation (EU) 2019/1020	Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011
SRD	Short-range device
TCAM	Telecommunication Conformity Assessment and Market Surveillance Committee (Committee of RED)
TD	Technical documentation
UHF	Ultra high frequency
VHF	Very high frequency