Overview

Monitoring of SRR implementation is required in Article 5 of the Decision in order to ensure that there is sufficient information to verify that no harmful interference is caused to other users of the 24 GHz band, which primarily is assured by verifying that the total number of vehicles equipped with SRR does not exceed 7% of the total automotive fleet. The type of information required is described in Article 5 and the annex to the Decision, and in sections 17 through 19 of the MoU.

This document is the third annual report to be submitted. Sales of SRR-equipped vehicles are consistent with the assessment submitted by the Commission Services to RSC#15 that –

> the uptake of 24 GHz SRR technology, while considered by the Commission as a very useful and instructive commercial demonstration of the concept of active road safety via technology (and of a pro-innovation spectrum policy), has been extremely limited to date.[5]

At this time, two manufacturers have implemented 24 GHz SRR into various model lines in Europe. Due to the regulatory constraints established under the Decision the number of SRR-equipped vehicles remains far below the 7% limit in Europe. As described to RSC#15, "it can already be stated now that the possibility of the 7% threshold for SRR-equipped cars being reached in any Member State by 2013 is very small."

Current Report on Vehicle Penetration

In its second report, SARA informed the RSCom that the data collecting unit of the Kraftfahrt-Bundesamt (KBA – Federal German Motor Transport Authority) submitted figures for the combined sales of cars equipped with 24 GHz SRR, which showed that cumulatively from the beginning of the program between 22,000 and 24,000 SRR-equipped vehicles had been produced for Europe, as of the end of May 2007. Based on

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[5] RSCOM06-96, 24 November 2006, at un-numbered page 2. In this document, Commission Services concluded that SARA's proposed approach towards monitoring "is considered fully satisfactory and proportionate to the objective of this activity."

252 million vehicles in the European automotive fleet, this production represented a fleet penetration of "about 0.008%," according to the KBA.[6]

In this third report, SARA informs the RSCom that KBA's data collecting unit reports that the percentage of penetration of SRR-equipped vehicles in Europe for the reporting period ending 31 May 2008 amounts to approximately 0.01.

SARA believes this level of information is a proportionate response to the requirements for this third year of monitoring, and similar detail would probably be reliable for the next reporting period so long as the magnitude of the penetration remains similar.

SARA has also undertaken further steps to verify this information. SARA conducted a survey in June 2008 of its active members to verify that (1) no company was aware of any installation or sales of 24 GHz ultra-wideband SRR in vehicles sold in the European Union, or CEPT countries in general, in addition to the sales SARA was preparing to report; and (2) no company was aware of any sales of stand alone or aftermarket 24 GHz ultra-wideband SRR equipment in the European Union or CEPT countries in general. Based on this survey and SARA's general information on the industry status of SRR, we are confident that this report is accurate and verified.

In addition to being consistent with the Commission Services' own assessment as noted above, these numbers are much lower than market penetration predictions that SARA submitted previously. Based on modeling of the vehicle fleet, historical registration (and deregistration) information; and experience with introduction of other safety-related technology, SARA estimated in the last report that penetration of SRR into the entire automotive fleet would remain under 3% for at least the first three to five years of the program, even if all manufacturers in Europe commenced from the outset to introduce SRR. However, the actual European market figures now make it apparent that the market is not increasing as predicted because this technology has not been widely implemented due to regulatory constraints. Based on ACEA figures, 7% of the European automotive fleet would be approximately 18,270,000 vehicles. The number of SRR-equipped vehicles as of May 2008 is a tiny proportion of this number.

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6 As SARA pledged in earlier discussion of the monitoring process, this figure represents percentages of the entire European car fleet. In light of the numbers involved, for this report neither SARA nor KBA have attempted to "back out" the number of vehicles that might have left the fleet due to accidents or malfunctions. As noted in the KBA report in annex 1, the European fleet number is taken from the ACEA report, which we believe is the most reliable source of such information.

Technology Developments – 79 GHz SRR

On 8 July 2004, the Commission adopted Decision 2004/545/EC on harmonisation of spectrum for 79 GHz SRR. Member States were to make that spectrum available for SRR by 1 January 2005.

As part of the same survey SARA conducted on 24 GHz implementation, SARA also asked members to supply non-confidential information on 79 GHz development. We caution that some such information is confidential; SARA members do not share this amongst themselves and cannot make it public in any other fora.

In its first two reports SARA provided background details on technology programs focused on development of 79 GHz SRR technology. The KOKON project was the first step towards development of 79 GHz technology and ran until the end of August 2007 – a synopsis of the final report from the project is attached. A successor program named RoCC (Radar on Chips for Cars) will focus on commercialization of 79 GHz technology, starting in middle 2008 and expected to run for three years – early background on RoCC is attached. The goals of the project, broadly stated, are the following:

- Radar on Chip (scalable universally usable radar transceiver for Short, Mid and Long Range)
- Automobile radar technology in 76 – 81 GHz frequency range; especially also SRR in 77-81 GHz range for affordable costs
- Continuation of development of SiGe semiconductor process and MMICs (500 GHz cut-off-frequency, high integration, reduction of power dissipation, better S/N sensitivity)
- Investigations of car integration (bumper, paintings, etc.) and integrated antenna for low cost SRR
- Packaging (feasibility only)

As an indication of issues under study, one SARA member active in the bumper technology sector informed the group of its work with materials and paints. Current testing with conducting and non-conducting materials indicate that 1-2 years of experimental testing will be required to prove applicability for series production. This information indicates that in addition to sensor technology also bumper materials and paints must be developed as part of RoCC.

Other Information

SARA member Daimler A.G. has implemented SRR into certain model lines is in its Mercedes-Benz. brand. On 10 June, Mercedes-Benz released the attached press information describing accident study calculations showing that the combination of SRR (under the brand name DISTRONIC PLUS) with a brake assist application could reduce an average of 20% of all rear-end collisions in Germany alone. In a further 25% of all collisions, the systems could contribute to a "significant reduction" of the severity of the accident. On motorways, rear-end collisions could be prevented by an average of 36%.

These calculations were developed independently of SARA and by the car manufacturer itself, which must be particularly rigorous in any claims of accident mitigation from specific technology applications. Nevertheless, the manufacturer is sufficiently confident in the results of this technology to issue the attached information.

Mercedes-Benz notes that in Germany alone "there are over 50,000 severe rear-end collisions every year, causing death of serious injuries to around 5,700 people." SARA suggests that if SRR technology can contribute at a minimum to reducing these collisions by 25%, then there is a compelling Community policy to encourage the widespread adoption of SRR.

Respectfully submitted,

Strategic **A**utomotive **R**adar frequency Allocation group

Contacts:

Chairman

Dr. Gerhard Rollmann

email: gerhard.rollmann@gr-consulting.eu

Legal Advisor

Gerry Oberst

Email: geoberst@hhlaw.com

Attachments

1. KBA materials
2. Final Synopsis of report for KOKON program
3. Background slide on RoCC program
4. Mercedes-Benz press information, 10 June 2008

Kraftfahrt-Bundesamt

Kraftfahrt-Bundesamt • 24932 Flensburg

European Commission

E-Mail

KBA

Reinhard.Schulte-Braucks@cec.eu.int
Ruprecht.Niepold@cec.eu.int

Your reference / your letter of:

Our reference:
320-935
Contact:
Frau Bückle
Phone: +49 (4 61) 3 16-20 23
Fax: +49 (4 61) 3 16-
E-Mail:
claudia.bueckle@kba.de

Date: 10.06.2008

Subject: Report on the use of the 24 GHz frequency range by automotive short-range radars as of June 2008

Introduction

Art. 5 of the decision 2005/50/EC requires monitoring of the use of 24 GHz frequency range by automotive short-range radars (SRR) in order to ensure that the total number of vehicles equipped with SRR does not exceed 7 % of the total automotive fleet in the European Union.

According to the concession of the Commission the annual reports of the first three years may be based on European fleet figures only.

The first report was submitted to the Commission by the **S**hort **R**ange **A**utomotive **R**adar Frequency **A**llocation group (SARA) in July 2006 (document RSCOM06-53).

The second report- regarding the period from June 2006 to Mai 2007- was submitted in June 2007 to the Commission by the German Kraftfahrt-Bundesamt (KBA- Federal German Motor Transport Authority) in pursuit of a guaranteed independent and reliable report. As a result of this report the percentage of penetration of SRR-equipped vehicles in Europe amounted to approximately 0.008.

This document presents the third and last annual report, providing information about the level of fleet penetration of vehicles equipped with SRR in Europe. In future Member States (MS) have the obligation to evaluate the percentage on basis of the registered number of vehicles within their respective country and report the results to the Commission.

As already mentioned in earlier correspondence the KBA has been accepted by the Commission and MS as a reliable reporting authority on the percentage as described above and in future as a provider of the collected data transmitted by the manufacturers to interested MS.
Up to now only 3 MS took interest in receiving this collected data.

Office building:	Office hours:	Phone:	Fax:	Bank account:
Fördestraße 16 24944 Flensburg Germany	Mon. - Thurs. 8:30 am - 3:00 pm Fri. 8:30 am - 2:00 pm	+49 (4 61) 3 16-0 E-Mail: kba@kba.de	+49 (4 61) 3 16 16 50 +49 (4 61) 3 16 14 95 Internet: www.kba.de	Deutsche Bundesbank, Filiale Kiel BLZ: 210 000 00, Acc. No. 210 010 09 IBAN: DE27 2100 0000 0021 0010 09 BIC: MARKDEF1210

KBA

Report

Two car manufacturers introduced 24 GHz- SRR into their production line since decision 2005/50/EC entered into force (as SARA mentioned in the first annual report, introduction of SRR into the market started in September 2005).
Both manufacturers provided production data of vehicles equipped with SRR to the KBA.

Based on ACEA`s 2008 publication[1], the total number of the European automotive fleet can be approximated as of 261 million vehicles on June, 1st 2008. As a result of the data submitted by the manufacturers the percentage of penetration of SRR-equipped vehicles in Europe for the reporting period ending at May 31,2008 amounts to approximately 0.01.

As already stated in the second report this result stays on the conservative side of estimation considering the fact that ACEA`s European fleet data is incomplete: some of the EU-23-MS (eg. Hungary and Lithuania) have not delivered any data yet, so that the calculated percentage of 0.01 would be even less, if related to a complete EU-23 data basis.

Respectfully submitted,

(Claudia Bückle)

[1] http://www.acea.be/images/uploads/st/20080129_EU%20Motor%20Vehicles%20in%20use%202006.pdf

Annex 2 – Synopsis of Kokon final report

Responding to the European frequency regulations for SRR, a research project was formed with the name "Automotive High Frequency Electronics KOKON". The project was funded by Germany. The participating companies were Daimler (Sensor requirements), Bosch and Continental Automotive (System Supplier), Atmel and Infineon (Semiconductor manufacturers).

The project addressed the sensor specification at 79 GHz, the development of chip technology and the development of a first sensor prototype. It lasted from 2004 until 2007.

Executive Synopsis (Taken from Final Statement 25 February 2008)

In the future, great importance will be given to driver assistance and systems for active and passive safety, which help to recognize dangerous situations early and therefore prevent accidents or at least reduce the severity of accidents. Traffic accidents are not an inevitable side effect of traffic and mobility, but in most cases, are consequences of preventable human failure.

If one evaluates only the economic consequences of accidents, then in Germany alone, annual property damages cost approximately 35 billion euros. In addition, according to a study by the ADAC, traffic jams on German highways cause additional economical damage (loss) of approximately a quarter billion euros. Every third traffic jam is caused by an accident.

These facts support the importance of activities to improve passive safety systems and the need for research on active safety and assisting systems in motor vehicles.

Such systems require sensors that are capable of detecting objects surrounding a vehicle. This approach creates an electronic envelope or cocoon (basis for the name of the public funded BMBF project "Kokon") around the vehicle, which monitors dead angles, recognizes obstacles, activates protection and safety systems, detects pedestrians, protects inferior road users, enables semiautomatic driving in dense traffic (Stop and Go) or platoon driving, and assists in parking situations.

Such an electronic safety cocoon can be created with radar sensors. The first driver assistance systems for automatic distance regulation and obstacle alerts using radar ("intelligent/adaptive cruise control") are already on the market.

Only with a substantial penetration of such systems in the vehicle fleet can the number of accidents be drastically reduced and substantial economical damage be avoided. A major proven effect of such systems is improved traffic flow and decrease of the risk of traffic jams. The economical and ecological effect deriving from these results could be immense and could preserve sustainable mobility for users of motor vehicles.

* * *

Today's systems in Europe use Long Range Radar Sensors (LRR) operating in the frequency range 76-77 GHz and Short Range Radar sensors (SRR) in the frequency range 22-26.5 (24) GHz. In Europe the frequency allocation for SRR (UWB SRR in contrast to Narrow Band SRR, operating in the ISM-band 24-24.25 GHz) is limited in time (2013) and fleet penetration. After the middle of 2013 SRR sensors of new cars have to operate in the frequency range 77-81 GHz. In order to maintain the availability of these safety-relevant sensors in the future, two missions arise:

1. Research and development for systems with a threefold higher frequency compared to 24 GHz.

2. Development of a technology which also allows, at a higher frequency, an affordable implementation of the systems. This is a precondition that sensors can be introduced to all vehicle categories and not only in high class cars to increase road safety by their wide-spread introduction, reduce accident rates and offer increased comfort to as many drivers as possible.

One of the semi-conductor technology which fulfills these conditions is Si/SiGe (Silicon and Silicon-Germanium, respectively) technology. This technology is based on semi-conductor "mainstream" silicon that has a physical frequency limit up to 200 GHz and also offers the technological preconditions for an affordable supply of the necessary high frequency components and chips. However, this Si/SiGe-technology has to advance into in a new high frequency range which is not yet existing for mass-market applications, and in consequence requires fundamental research and development.

In parallel, specifications for the sensor used to create the "electronic envelope/cocoon" must be investigated, defined and specified, in order to determine the necessary parameters for the high frequency components and chips. For instance, the integration of HF-components and chips for short and long range radar sensors requires application of nano-electronic technologies and the development of appropriate assembling and connection techniques.

The project "Kfz Höchstfrequenzelektronik (motor vehicle highest frequency electronic) Kokon", lasted between 1 September 2004 and 31 August 2007. The most important German semi-conductor producers (Infineon, Atmel), the most important German driver assistance developers (Bosch, Continental) and a large German car manufacturer (Daimler) worked together and were supported by competent universities and institutes. Project goal was to develop a demonstrator sample of a Long Range and a Short Range Radar sensor as a basis for transferring 24 GHz UWB SRR technology to 79 GHz with an adequate - but as far as possible reduced - risk.

* * *

Based on the results of Kokon, the following statements can be made:

- With SiGe, specifications for automobile radars to electronic components with an operating frequency of 77 GHz can be fulfilled.
- Compared to currently available GaAs-components, SiGe MMICs (Monolithic Microwave Integrated Circuits) show significant advantages regarding performance, reliability, testing technology and costs.
- SiGe opens new possibilities of integration. Continued advancements based on the results from Kokon should lead to configurable single-chip radars with integrated diagnostic possibilities.
- The use of SiGe makes integrated technologies possible that can fulfill the requirements of automobile manufacturing.

- SiGe MMICs will be used as key components for the next generation of long range radars at Robert Bosch GmbH.

* * *

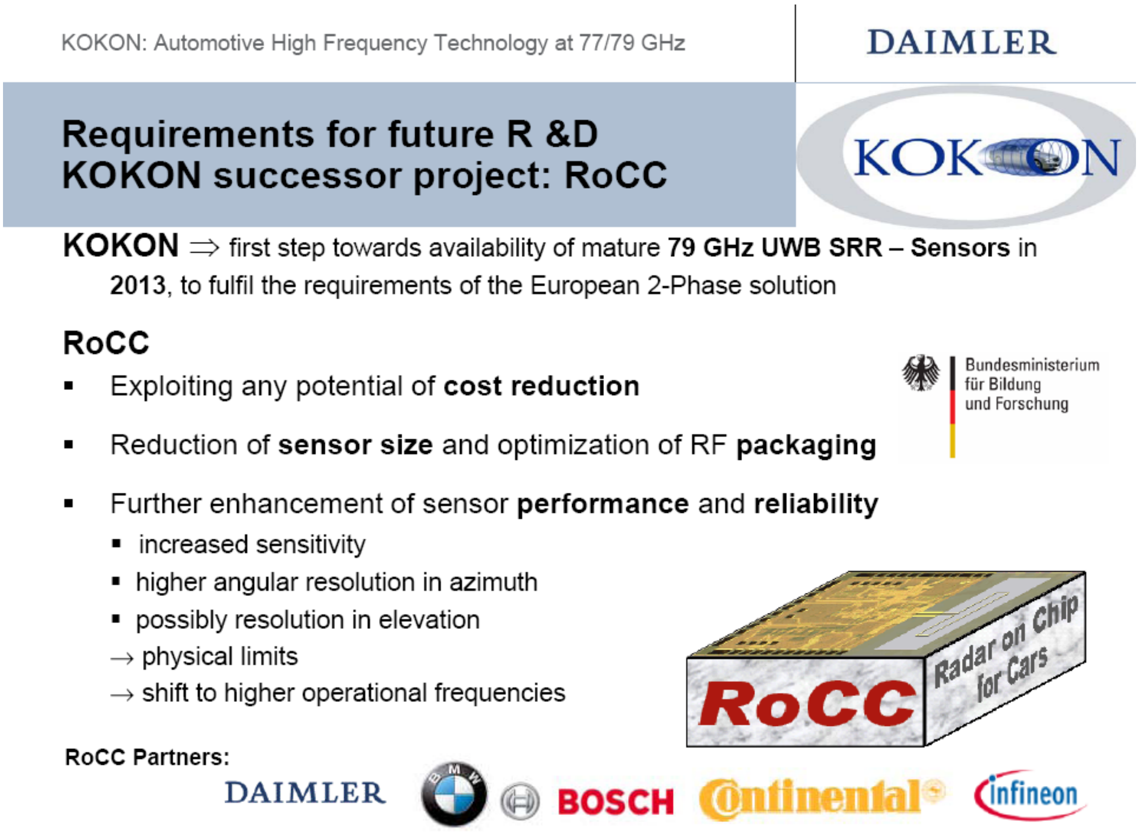
The results of the Kokon project can be summarized as follows:

- World record for highest frequency electronics with SiGe technology from Infineon Technologies
- World-wide first demonstration of SiGe based HF-front-ends for automotive radar sensor system in the 76-81 GHz band and realization of MMICs
- Demonstration of the world-wide first SiGe based automotive radar technology (77 GHz long range sensor products by Bosch, 79 GHz UWB short range sensor prototypes by Continental)
- Standardization through collective specification of SiGe components.

Altogether the project is to be evaluated as very successful: it involved the entire chain from the semi-conductor, the module and system manufacturer up to the car manufacturer. A large step in the direction of economical SiGe based radar was accomplished.

KoKon developed the basic technology for SiGe sensors in the high frequency range from 76 – 81 GHz including successful demonstration of feasibility of sensor prototypes.

Annex 3 – Background on RoCC



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translation on following page

Transition to RoCC from KOKON

KOKON	RoCC
• GaAs => Si Si/Ge	MMIC high integration
• SiGe 200GHz	SiGe 500 GHz
• Several technology approaches	focus on 1 Si – basis process
• ..	
• I/Os	fully differential circuit technology
• First Step for built-in test	self-test, -diagnosis, -calibration
• Long and Short Range Radar	multimode and multirange
• 1 OEM participant	2 OEM participants
• 78 – 81 GHz	76 – 81 GHz plus evaluation of >100 GHz

Annex 4 – Mercedes-Benz press information

Mercedes-Benz

Recent Mercedes-Benz accident study calculation

Press Information

June 10, 2008

20 percent fewer rear-end collisions thanks to DISTRONIC PLUS and Brake Assist PLUS

Stuttgart – DISTRONIC PLUS and Brake Assist PLUS, the Mercedes-Benz assistance systems based on sophisticated radar technology, make an effective contribution to accident prevention. This is the conclusion reached after an analysis carried out by Mercedes-Benz on the basis of representative accident research data. With the help of this technology an average of one fifth of all rear-end collisions could be prevented in Germany alone. And on motorways, rear-end collisions could be reduced even further: by an average of 36 percent. The Mercedes-Benz systems warn drivers when they are maintaining too little distance from the vehicle travelling in front and provide support in the event of emergency braking.

Engineers working for the Stuttgart-based car manufacturer have developed a procedure which for the first time makes possible a predictive calculation of the usefulness of new safety technologies. For this the specialists have taken into account both official statistics and the analysis of the approximately 16,000 traffic accidents which have so far been studied within the framework GIDAS (German In-Depth Accident Study).

The evaluation of the safety potential offered by the DISTRONIC PLUS and Brake Assist PLUS assistance systems is based on the reconstruction of more than 800 rear-end collisions. The focus of the representative study was the question: how many of those accidents could have been avoided if all the passenger cars had been equipped with this Mercedes-Benz technology?

The results confirmed the great safety effect of the systems: with DISTRONIC PLUS and Brake Assist PLUS an average of more than 20 percent of all rear-end collisions could be prevented. In a further one-quarter of all collisions the systems could contribute to a significant reduction of the severity of the accident.

Daimler Communications, 70546 Stuttgart, Germany
Mercedes-Benz – A Daimler Brand

The greatest safety potential is offered by the interaction of modern radar and braking technology on motorways, where around 36 percent of all rear-end collisions could be avoided.

Around 40 percent of all S-Class saloons equipped with radar technology

The DISTRONIC PLUS proximity control system keeps your vehicle at a previously chosen distance from the vehicle travelling in front and, if necessary brakes your vehicle to a complete standstill, depending on the traffic situation. If the distance to the preceding vehicle narrows down too rapidly, the system warns the driver and calculates the required brake pressure, which is then provided instantaneously by the Brake Assist PLUS system as soon as the brake pedal is depressed. Should the driver disregard the warning, the PRE-SAFE® Brake system performs an emergency partial braking manoeuvre, significantly reducing the severity of the impact.

Since 2005, Mercedes-Benz has offered these radar-based assistance systems for the S-Class, and since 2006 for the CL luxury coupé. Around 40 percent of all German customers buying new S-Class vehicles equip them with this safety technology; while the proportion of CL-Class outfitted with DISTRONIC PLUS and Brake Assist PLUS is even higher, exceeding 80 percent. Since 2005 Mercedes-Benz has delivered a total of more than 45,000 passenger cars featuring these innovative systems.

In order to calculate the safety benefits provided by this technology, Mercedes-Benz specialists make use of relevant data from the individual accidents, such as speed, distance to the other vehicle and driver's braking behaviour. With these data, together with the governing algorithms of DISTRONIC PLUS and Brake Assist PLUS, the individual speed reduction is calculated. The engineers from Mercedes-Benz decided to apply a conservative calculation principle and did not take into account, for example, the additional safety-enhancing effect of the visual and audible distance warnings which prompt the driver to apply the brakes himself if the system determines it can no longer avoid a collision by itself. The analysis is based on the assumption that the drivers ignore these warnings.

In Germany there are over 50,000 severe rear-end collisions every year, causing death or serious injuries to around 5,700 people. Of all the accidents involving personal injury, one in six is a rear-end collision. In the United States this accident type makes up around 30 percent of all serious traffic accidents.

The engineers of the Stuttgart-based car manufacturer continue to work tirelessly on the development of further driver assistance systems aimed at helping to prevent road accidents.

Contact:
Norbert Giesen, telephone: +49 (0)711-17-76422, norbert.giesen@daimler.com

Further information about Mercedes-Benz is available online:
www.media.daimler.com

SARA
Strategic Automotive Radar frequency Allocation

23 June 2009

To: European Commission

From: Strategic **A**utomotive **R**adar Frequency **A**llocation group

Subject: Report on the use of the 24 GHz frequency range by automotive short-range radars as of June 2009

The **S**trategic **A**utomotive **R**adar Frequency **A**llocation group (SARA) pledged in a Memorandum of Understanding (MoU) in order to provide information on 24 GHz ultra-wideband short range radar (SRR) to assist the monitoring required in Commission Decision 2005/50/EC (the Decision).[1] This fourth report is submitted for the period July 2008 to June 2009, and has been complied in accordance with agreed procedures stated in Doc. RSCOM06-54, dated 16 June 2006, from SARA, as further discussed below. As detailed below, SARA reports that penetration of SRR-equipped vehicles will be approximately 0.02% of the total number of vehicles in the European Union as of the end of June 2009.[2]

Overview

Monitoring of SRR implementation is required in Article 5 of the Decision in order to ensure that there is sufficient information to verify that no harmful interference is caused to other users of the 24 GHz band, which primarily is assured by verifying that the total number of vehicles equipped with SRR does not exceed 7% of the total

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1 Commission Decision of 17 January 2005 on the harmonisation of the 24 GHz range radio spectrum band for the time-limited use by automotive short range radar equipment in the Community, O.J. L 21, 25 January 2005, page 15.

2 This report contains no business-confidential information and can be made publicly available.

automotive fleet. The type of information required is described in Article 5 and the annex to the Decision, and in sections 17 through 19 of the MoU.

This document is the fourth annual report to be submitted. Sales of SRR-equipped vehicles are consistent with the assessment submitted by the Commission Services to RSC#15 that

> the uptake of 24 GHz SRR technology, while considered by the Commission as a very useful and instructive commercial demonstration of the concept of active road safety via technology (and of a pro-innovation spectrum policy), has been extremely limited to date.[3]

At this time, two manufacturers have implemented 24 GHz SRR into production lines in Europe. Due to the regulatory constraints established under the Decision the number of SRR-equipped vehicles remains far below the 7% limit. As described to RSC#15, "it can already be stated now that the possibility of the 7% threshold for SRR-equipped cars being reached in any Member State by 2013 is very small."

This report also contains updated information on the safety impact of SRR as well as information on status of 79 GHz SRR technology.

Current Report on Vehicle Penetration

In June 2006, SARA described the method it would follow for these submissions. At that time, SARA proposed the following

- For the submissions in 2007 and 2008, the Kraftfahrt-Bundesamt (**KBA** - Federal German Motor Transport Authority) would calculate the fleet penetration for Europe based on officially used figures.

- For ensuing years, the KBA would collect data on numbers of SRR-equipped vehicles and provide the European-wide penetration calculations to the Commission. The KBA also would provide the collected data to the different Member States; the Member States could then calculate their own national fleet penetration rates based on their knowledge of the number of

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3 RSCOM06-96, 24 November 2006, at un-numbered page 2.

vehicles on the road in their countries. The KBA would calculate national penetration figures only for Germany.

In light of the current market and economic context, SARA proposes to continue, for at least this year's submission, the collection solely of European-wide figures, and avoid the additional data processing for Member State calculations.

SARA is suggesting this approach in light of strained resources in the automotive industry generally and the flat impossibility that the numbers of SRR-equipped vehicles have reached the penetration limits in any Member State.

In last year's submission, SARA and the KBA reported that SRR-equipped cars as of mid-2008 represented about 0.01% of the total number of cars operating in the EU. SARA believes that approximately an additional 20,000 SRR-equipped vehicles have been placed on the market in the ensuing year. The industry has entered into a precipitous sales decrease in new car sales due to the economic crisis and the proportion of SRR-equipped vehicles is approximately 0.02% of the market (as KBA confirms in the attached report).

Under these circumstances, the effort to calculate national data seems disproportionate. We also understand that only few Member States have expressed interest in the collected data in past years. Thus, SARA has taken the same approach as last year with in submitting European-level data on the number of such vehicles. On request KBA is ready to deliver the number of cars at Member State level.

This approach should be sufficient to satisfy Article 5 of the Decision and verify that no harmful interference is caused to other users of the 24 GHz band. Interference was predicted only if the total number of vehicles equipped with SRR exceeded 7% of the total automotive fleet. At a 2008 penetration of 0.02%, there is no possibility of interference concerns being raised.

SARA conducted a survey in June 2009 of its active members to verify that (1) no company was aware of any installation or sales of 24 GHz ultra-wideband SRR in vehicles sold in the European Union, or CEPT countries in general, in addition to the sales SARA was preparing to report; and (2) no company was aware of any sales of stand alone or aftermarket 24 GHz ultra-wideband SRR equipment in the European Union or CEPT countries in general. Based on this survey and SARA's general information on the industry status of SRR, we are confident that this report is accurate and verified.

In addition to being consistent with the Commission Services' own assessment as noted above, these initial numbers are consistent with market penetration predictions that SARA submitted during the development of the Decision. Based on modeling of the vehicle fleet, historical registration (and deregistration) information; and experience with introduction of other safety-related technology, SARA estimated that penetration of SRR into the entire automotive fleet would remain under 3% for at least the first three to five years of the program, even if all manufacturers in Europe commenced from the outset to introduce SRR.

Safety Impact of 24 GHz SRR

The following information in section 1 is taken from SARA's submission to the European Commission consultation dated 2 February, which remains valid and timely.[4] Additional information is also submitted in section 2 on even more recent findings on the safety benefits of 24 GHz SRR.

1. Initial Safety Findings

When SRR regulations were adopted, policy makers assessed the real world benefits of the technology. The US FCC stated in 2002 when it adopted 24 GHz SRR rules that it expected "vehicular radar to become as essential to passenger safety as air bags for motor vehicles…."[5] When it adopted national rules based on the EC decision, the UK's Ofcom assessed on a comparative basis that "the benefits of use of SRR equipment, which would accrue to road users, are expected to outweigh costs of use of SRR in the 24 GHz band, which would accrue to other users of the band…." It further decided that "assuming conservatively that this equipment may only be successful in stopping 5% to

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4 Annexes from the original submission are deleted.

5 FCC, Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, First Report and Order in ET Docket 98-153, 22 April 2002, at paragraph 18.

10% of accidents involving vehicles with the equipment installed, the net present value of the benefits from using automotive SRR devices are estimated to range from £139 to £279 million over this period [2010 – 2014]."[6]

Daimler subsequently conducted a study analyzing real accidents, using the GIDAS data bank (German In-Depth Accident Study) to focus on rear end crashes as one of the most relevant kind of crashes. SARA presented the first results of this study in its earlier request for a fundamental review of 24 GHz SRR regulations. That evaluation was based on statistics from 16,000 accidents and in particular reconstruction of more than 800 rear-end collisions.

In a September 2008 presentation to the World Automotive Congress, Daimler noted that **20% of all rear end crashes could have been avoided** if the cars had been equipped with SRR based intelligent brake assistance. Even in cases when the crash was unavoidable the reduction of crash energy was significant and the **severity of the crash consequences would have been mitigated in 25% of the accidents**. These accidents are a major cause of serious accidents. Daimler has reported that each year in Germany alone there are over 50,000 serious "head-to-tail" crashes, in which some 5,700 people are either killed or seriously injured. One in six traffic accidents in which people are injured are caused by such accidents. Daimler also has noted that as many as 9,500 serious road accidents involving lane changes are caused on German highways each year, which could be mitigated by blind spot detection based on SRR.

These conclusions have been supported by various experiments using driving simulators and further statistical assessments. Automobile Clubs made their own tests and reported about the effectiveness of precrash measures activated by UWB SRR. The result of speed reduction by brake assistance from 50 to 37.5 km/h was estimated to reduce acceleration overload in a crash for the driver by 27%, and for the passenger by 30%. In addition, the pre-tensioning of seat belts would reduce the risk of severe in injury by

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6 Ofcom, "Decision to exempt the use of automotive short-range equipment in the 24 GHz band from Wireless Telegraphy licensing, Statement and Statutory Regulations" 14 June 2005, paragraphs 4.22 and 4.8. Ofcom assumed at that time that the SRR regulatory framework would work satisfactorily and that take-up of both 24 GHz and 79 GHz SRR would increase over the 2010 – 2014 period from 1% to 13%. This penetration is no longer foreseen, due to the regulatory structure.

13%. This motorclub also stated that after market introduction in luxury cars the option should be followed quickly by deployment in all segments of car lines.

Vehicle applications such as Collision Warning and Emergency Braking Systems are part of the Commission's Action Plan for the Deployment of Intelligent Transport Systems in Europe. The Commission has stated recently that "better use should be made of the newest active safety measures," and in large part SARA believes encouragement for customer-driven deployment of SRR is a critical element in those projects.[7]

European programs funded by the Community make use of SRR technology, e.g., the APROSYS projects on integrating active and passive safety systems, and active safety PREVENT projects such as INSAFE, COMPOSE and APALACI.[8] Substantial research programs at the national level have been devoted to analyzing the impact of SRR – for example the UK's SHORSEN project funded at £457K from 2000 – 2003.[9] Substantial government funding has been dedicated to 24 GHz SRR, on the basis that development of this technology can make a significant impact on road safety.

2. Recent Safety Findings

The following section concerns additional information available on automotive safety. Assessment of the impact of active safety systems follows a specific progression, starting from theoretical assessments of the impact of new technology, to statistical modeling based on accident behavior in light of the new technology, and finally to real world assessments using accident data. SARA earlier reported the results of the Daimler September 2008 analysis based on real world data from the GIDAS data bank.

Subsequent and even more depth analysis based on that data validates the earlier assessment. Several papers especially relevant to this issue were presented at the 21st

7 Commission, "Action Plan for the Deployment of Intelligent Transport Systems in Europe," COM(2008) 886, 16 December 2008, section 4.3.

8 See Final Report, Preventive and Active Safety Applications, Integrated Project, Contract number FP6-507075, 7 May 2008, at http://www.prevent-ip.org/.

9 See Foresight Vehicles Research Projects, 2006, at page 58.

International Technical Conference on the Enhanced Safety of Vehicles, 15-18 June, Stuttgart, DE.[10]

Daimler Group Research & Advanced Engineering submitted an extensive analysis at the conference entitled "The vision of accident free driving." The paper presents a detailed analysis of accident data and assesses the impact of SRR active safety devices. In particular, it reviews the impact of Distronic PLUS, which is Daimler's trade name for 24 GHz SRR technology (combined with 77 GHz long range radar) implemented into Mercedes vehicles and integrated into other safety functions, most notably Break Assist PLUS.

Among the assessments of this comprehensive analysis is that the safety potential of these systems is "especially evident in extra urban settings on highways and freeways or motorways." It states that the systems "prevented more than 37 percent of rear-end crashes in average. In another 31 percent of these collisions, the system can help to reduce accident severity greatly." Notably, it is this type of accident category in which about 57 percent of all fatalities and 62 percent of all serious injuries happened on German motorways.

The paper also analyzed the number and severity of accidents likely avoided or mitigated based on assessment spare part inventory statistics (i.e., spare parts needed to repair vehicles involved in accidents). The paper states the SRR package "was able to prevent 53% of all rear-end collisions with injuries."

This detailed statistical analysis concludes that "the predicted efficiency in avoiding or mitigating rear-end collisions of the Distronic PLUS package could be demonstrated in the event of real life accidents for a representative large-scale sample size."

Daimler's real world analysis of traffic accident effects is confirmed by other papers presented at the conference. For instance, a paper presented by the Swedish Road Administration in conjunction with research personnel on automatic emergency braking

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10 Final program available at http://www.esv2009.com/fileadmin/esv/documents/Final_Program.pdf.

concluded that reduction of speed before impact by 10% "gives a reduction of fatality risk by 31% and the risk of a serious injury by 19%."[11]

The German Insurers Accident Research body "UDV" presented a paper assessing accident claims based on all third party vehicle insurance claims, using a representative cross-section of all such claims for 2002-2006.[12] Its data bank is comparable to the GIDAS data used in the Daimler study, but involves only serious accidents (i.e., those involving personal injury and at least €15,000 total claim value). Among other advanced driver assistance systems, UDV assessed the impact of collision mitigation braking systems (CMBS), including a category of such systems "done almost exclusively with radar sensors." For this category of active safety technology, the UDV found there is a "fundamentally high safety potential." It calculated that if 100% of all cars were equipped with such technology, "12.1% of all car accidents in the database could be avoided" and 28% of all rear-end collisions could be avoided. Their conclusion was that, after electronic stability control, "CMBS are the systems that deliver the greatest safety potential in the field of active safety. They should therefore be fitted to the car fleet as soon as possible."

Other Market Developments – 79 GHz SRR

The following text is taken from SARA's submission to the European Commission consultation, dated 2 February, which remains valid and timely.

Development of 79 GHz SRR technology has proceeded in a satisfactory fashion. SARA has reported to the Commission that companies in the complete supply chain – car manufacturers, sensor manufacturers and their sub-suppliers as well as bumper manufacturers – have been engaged in serious efforts to reach this permanent frequency solution. SARA is alarmed, however, that spectrum managers and regulators have not taken into account the lead times and stages of automotive equipment development, and the intrinsic differences between that process and that of other, perhaps more familiar,

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11 M. Krafft, C. Tingvall (Director, Traffic Safety, Swedish Road Administration) et al., "The effects of automatic emergency braking on fatal and serious injuries."

12 M. Kuehn, et al., German Insurers Accident Research, "Benefit estimation of advanced driver assistance systems for cars derived from real-life accidents."

technology. The integration of new semi-conductor chip technology into automotive sensors, and the follow-on integration of those sensors into a safety technology requires a completely different timeframe than that, for example, of a new GSM terminal or radio receiver.

Development of an automotive safety system requires at least a four-step process: (i) semi-conductor development; (ii) sensor development; (iii) car integration and application development; and (iv) real world testing. The technology, sensor and system development is primarily done by the supplier; the application development is done mainly by the car manufacturer (OEM) or needs at least a close cooperation between supplier and OEM. Detail on these steps in the context of SRR is provided in the following table –

Process step	Comment
Semi-conductor development	The first step for 79 GHz SRR has been accomplished through the KoKon project, from 2004-2007. A long range radar (LRR) sensor based on these semiconductors will be available on the market in 2009-2010.
Sensor development	Chipsets must be integrated into radar sensor applications. This step is underway through the RoCC project, from 2008-2011, and sensor development by suppliers.
Car integration and application development	Sensors must be developed to a stage that they can be shown to be suitable for mass production, available for integration into mass production car lines. System development includes sensor vehicle integration, and software interface between sensor and vehicle electronics. In addition to the sensor the bumper has to be adapted. Materials and paintings must be developed or optimized so that they are suitably transparent at the higher frequency of 79 GHz.
Test under real world conditions	The verification of system performance must be shown. Because the applications are for road safety, up to 1 million kilometers of testing on the road under normal traffic conditions and post-simulation in the laboratory must be carried out. Therefore the earliest release for car series production requires a lead time of several years after having sensors available for car integration.

24 GHz was the first technology to open the window to object detection around the car. Higher frequency technology is well known from 77 GHz ACC, which does not, however, support UWB applications due to frequency limitations. The critical issue for 79 GHz technology is the need to bring cost down to make sensors affordable for all customer and sufficient testing to ensure there are no liability or safety issues.

79 GHz will be the next generation technology platform after 24 or 26 GHz, and it will give the opportunity to improve sensor performance, with important size and performance advantages. But until recently, 79 GHz technology for SRR was still in the research phase. A first project named Kokon 2004-2007 was focused on semiconductor technology using SiGe semi-conductor applications instead of GaAs. The successor project named RoCC (Radar on Chip for Cars) started in 2008 and will last until 2011. Its focus is sensor technology (e.g. low cost packaging of 79 GHz MMICs, improved MMIC transit frequencies, and better heat dissipation).

There is great enthusiasm within SARA about progress towards 79 GHz technology, and both OEMs and suppliers are heavily involved in this development. The manufacturers cannot contemplate integration of 79 GHz SRR into production lines, however, until at least two additional crucial steps are finalized. First, it must be demonstrated that the sensors can be built by suppliers on a mass production basis. Second, the resulting system must be tested under real world conditions. This latter step cannot be avoided or foreshortened, because it is the basis for liability and safety considerations. Typically new safety equipment must be "test driven" for up to 1 million km to ensure it can be sold to the public as a reliable and safe option.

Without a working sensor system integrated in the car it is not possible to perform the testing on the application level as required due to automotive quality standards. Safety applications must undergo extensive testing to ensure reliable performance in all traffic situations. Therefore it is desirable that all car manufacturers start working on the application level as soon as possible.

The availability of 26 GHz sensors would allow all car manufacturers to start with the development of safety applications based on today's radar sensor technology. In the mid and long term the car manufacturers will decide either to use 26 GHz sensors for a longer time or will use superior 79 GHz sensors. 26 GHz UWB systems will open the market for 79 GHz sensors. Without 26 GHz many car manufacturers cannot develop SRR safety applications for the next few years because they have to wait until systems based on 79 GHz are integrated in the vehicle. In this situation, the use of radar-based safety systems on a large-scale will be further delayed and the technology gap between 24 GHz and 79 GHz will be extended for many years.

One way to overcome barriers to ultimate take-up of 79 GHz SRR as a means to ensure automotive safety is to encourage existing SRR technology. The current 24 GHz SRR provides a platform for consumer acceptance and market entry. It is thus providing an impetus for longer term acceptance and economies of scale for 79 GHz SRR. If that impetus is interrupted by the regulatory framework, then market acceptance of 79 GHz SRR is threatened.

Respectfully submitted,

Strategic **A**utomotive **R**adar Frequency Allocation group

Contacts:

Chairman
Dr. Gerhard Rollmann
email: gerhard.rollmann@gr-consulting.eu

Legal Advisor
Gerry Oberst
Email: geoberst@hhlaw.com

Attachment

KBA submission as received by SARA

Kraftfahrt-Bundesamt

E-Mail

KBA

Philippe.jean@ec.europa.eu
Frank.greco@ec.europa.eu

Kraftfahrt-Bundesamt • 24932 Flensburg

European Commission

Your reference / your letter of:

Our reference:
320-935
Contact:
Claudia Bückle
Phone: +49 (4 61) 3 16-20 23
Fax: +49 (4 61) 3 16-2833
E-Mail:
claudia.bueckle@kba.de

Date: 22.06.2009

Subject: Report on the use of the 24 GHz frequency range by automotive short-range radars as of June 2009

Introduction

Art. 5 of the decision 2005/50/EC requires monitoring of the use of the 24 GHz frequency range by automotive short-range radars (SRR) in order to ensure that the total number of vehicles equipped with SRR does not exceed 7 % of the total automotive fleet in the European Union.

According to the concession of the Commission the annual reports of the first three years may be based on European fleet figures only.

The first report was submitted to the Commission by the **S**hort **R**ange **A**utomotive **R**adar Frequency **A**llocation group (SARA) in July 2006 (document RSCOM06-53).

The second report- regarding the period from June 2006 to Mai 2007- was submitted in June 2007 to the Commission by the German Kraftfahrt-Bundesamt (KBA- Federal German Motor Transport Authority) in pursuit of a guaranteed independent and reliable report. As a result of this report the percentage of penetration of SRR-equipped vehicles in Europe amounted to approximately 0.008.

The third document presented to the Commission in June 2008 was regarded as the last annual report on an Europe-wide basis, providing information about the level of fleet penetration of vehicles equipped with SRR in Europe. The percentage proved in the third report was of 0.01. From the period beginning in June 2008 decision 2005/50/EC obliges Member States (MS) to evaluate the percentage on basis of the registered number of vehicles within their respective country and report the results to the Commission.

Germanys Federal Motor Transport Authority (KBA) has been accepted by the Commission and MS as a reliable reporting authority on the percentage as described above and in future as a provider to interested MS of the collected data transmitted by the manufacturers.
However, the automotive industry represented by SARA informed the Commission that the penetration of SRR equipped vehicles is still small and SARA therefore suggested drawing up

Office building:	Office hours:	Phone:	Fax:	Bank account:
Fördestraße 16	Mon. - Thurs. 8:30 am - 3:00 pm	+49 (4 61) 3 16-0	+49 (4 61) 3 16 16 50	Deutsche Bundesbank, Filiale Kiel
24944 Flensburg	Fri. 8:30 am - 2:00 pm		+49 (4 61) 3 16 14 95	BLZ: 210 000 00, Acc. No. 210 010 09
Germany				IBAN: DE27 2100 0000 0021 0010 09
		E-Mail: kba@kba.de	Internet: www.kba.de	BIC: MARKDEF1210

another report on an Europe-wide basis. As the Commission agreed, this fourth report concerns European data only.

Report

Two car manufacturers introduced 24 GHz- SRR into their production line since decision 2005/50/EC came into force (as SARA mentioned in the first annual report, introduction of SRR into the market started in September 2005).
Since then, both manufacturers provided annual production data of vehicles equipped with SRR to the KBA.

Based on ACEA`s 2009 publication[1], the total number of the European automotive fleet can be estimated to be 253 million vehicles on June 1st 2009. As a result of the data submitted by the manufacturers the percentage of penetration of SRR-equipped vehicles in Europe for the reporting period ending at May 31st 2009 amounts to approximately 0.02.

Like the reports before this result stays on the conservative side of estimation considering the fact that ACEA`s European fleet data is incomplete: some of the EU-23-MS (eg. Hungary and Lithuania) have not delivered any data yet, so that the calculated percentage of 0.02 would be even less, if related to a complete EU-23 data basis.
Besides, it is likely that not all of these vehicles equipped with SRR are still in use.

Yours respectfully,

Claudia Bückle

[1] http://www.acea.be/images/uploads/files/20090218_EU_Motor_Vehicles_in_Use_2007.pdf

日本自動車輸入組合
Japan Automobile Importers Association

自輸第8043号
平成20年10月16日

総務省　情報通信審議会
情報通信技術分科会　ＵＷＢ無線システム委員会
事務局　御中

日本自動車輸入組合
専務理事　大慈弥　隆人

UWBレーダ（車載レーダ）に係わる登録台数の情報開示について

拝啓　時下ますますご清栄のこととお慶び申し上げます。
さて、標記のＵＷＢレーダの市場浸透に伴う既存の無線システムへの障害対応として、別添のとおり当組合の管理要領により実施致したく、ご報告いたします。
つきましては、何分のご配慮を賜りたくよろしくお願い申し上げます。

敬具

〒105-0014 東京都港区芝 3-1-15　芝ボートビル５階
Shiba Boat Bldg. 5F, 3-1-15 Shiba, Minato-ku, Tokyo 105-0014, Japan
Phone: 03-5765-6811　　Fax: 03-5765-6847

別添

ＵＷＢレーダ（車載レーダ）に係わる登録台数に係わる管理要領

１．適用範囲

この管理要領は、日本自動車輸入組合（JAIA）に加盟する輸入事業者によって輸入・販売され、24GHz のＵＷＢレーダを搭載する自動車に適用する。

２．管理要領

JAIA は前項の自動車について、（１）項の管理体制をとり、（２）項により情報開示を行なうこととする。

（１）管理体制

JAIA事務局は、JAIAに加盟する輸入事業者の内、（２）に係わり自己管理を行なう輸入事業者グループを形成し、その総括管理を行なうものとする。もし、そのグループに属さない輸入事業者が当該UWBレーダを搭載した自動車の販売・登録を開始する場合には、その事業者が事前に前述の自己管理グループに属するように適切な指導を行なう。

（２）ＵＷＢレーダ市場導入台数の情報開示

販売登録した1項の自動車の台数およびその自動車に搭載したレーダの個数を四半期毎に調査し、各四半期の翌月にJAIAのホームページにて公開する。なお、累積台数と累積個数が制限値に近づいてきた場合には、四半期毎の調査～公開の頻度を上げることとする。以上のスキームをもって、輸入車全体の累積台数と累積個数を管理しつつ、情報開示を行なう。

３．適用時期

本管理要領は、１項の自動車に搭載されるＵＷＢレーダの市場導入が認められた時点から適用する。

〒105-0014 東京都港区芝 3-1-15 芝ボートビル５階
Shiba Boat Bldg. 5F, 3-1-15 Shiba, Minato-ku, Tokyo 105-0014, Japan
Phone: 03-5765-6811 Fax: 03-5765-6847

日本自動車輸入組合
Japan Automobile Importers Association

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社団法人 日本自動車工業会
ITS 技術部会
スマートシステム分科会 御中

日本自動車輸入組合
基準・認証委員会 御中

日本自動車輸入組合
副理事長兼専務理事 大慈弥 隆人

UWB車載レーダーの自主管理について

MIC UWBレーダー作業班の合意に基づき、日本自動車輸入組合(JAIA)事務局がセンターとなり、UWBレーダー搭載自動車の国内台数の自主管理体制を作りたいと考えます。

別紙1に体制案を提示いたしますので、貴会に所属の各社においてご検討いただき、UWB車載レーダー装置の導入に、ご関心をお持ちの各位は、別紙2に参加のご希望と、2016年までの各社の販売予測台数を、3月23日(月)までにJAIA事務局(下記)までお知らせください。

本件に関する申し込み及びお問合せ先:
日本自動車輸入組合(JAIA)
事務局 田代 昌一
TEL 03-5765-6828 FAX 03-5765-6847
e-mail tech@jaia-jp.org

〒105-0014 東京都港区芝3-1-15 芝ボートビル5階
Shiba Boat Bldg. 5F, 3-1-15 Shiba, Minato-ku, Tokyo 105-0014, Japan
Phone: 03-5765-6811 Fax: 03-5765-6847