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Marlene H. Dortch, Esq.
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: **Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems**
ET Docket No. 98-153
***Ex Parte* Communication**

Dear Ms. Dortch:

Pursuant to Section 1.1206(b) of the Commission's rules, I am writing on behalf of Siemens VDO Automotive AG ("Siemens VDO") to respond to the August 20, 2003 Reply Comments filed jointly by Northrop Grumman Corporation and the Raytheon Company (the Companies") in response to the Further Notice of Proposed Rulemaking ("Further Notice") in the above-referenced docket.[1] In their Reply Comments, the Companies asked the Commission to impose stricter operating limits on the pulsed frequency hopping vehicular radars under development by Siemens VDO, as a condition of their authorization as ultra-wideband ("UWB") devices. The Companies expressed concern that the Siemens VDO radars might cause harmful interference to the Earth Exploration Satellite Service ("EESS") satellites the Companies are developing for operation in the 23.6-24.0 GHz band. As discussed below, such concerns are unfounded.

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[1] *See* Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, ET Docket 98-193, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking,* FCC 03-33 (rel. Mar. 12, 2003) ("*Further Notice*").

The Reply Comments appear premised on the faulty assumption that permitting the Siemens VDO radars to operate as UWB devices would result in an overall increase in the number of vehicular radars operating in the 23.6-24.0 GHz band, and therefore in an increase in the potential for interference to EESS sensors due to cumulative emissions exceeding established limits.[2] As Siemens VDO previously explained in its Petition for Reconsideration, this is not the case:

> NTIA derived the attenuation levels [applicable to all UWB vehicular radars, now codified at 47 C.F.R. §15.515(c)] based on explicit assumptions about vehicle densities and the rate of vehicular radar deployment in the new vehicle market. Specifically, NTIA and SARA assumed a worst-case scenario that 40% of all vehicles in use would be equipped with vehicular radars by 2016.[3] This 40% penetration figure was based on an unrealistically aggressive deployment assumption that every new vehicle after 2005 would be equipped with vehicular radar. As such, it was not based on the number of component manufacturers, nor was it predicated on the types of modulation techniques to be used. The ultimate vehicular radar market penetration will be the same, regardless of the presence of pulsed frequency hopping devices in the market, as any unmet demand would simply be filled by other device designs. Therefore, the grant of this Petition would not change the assumptions that underlay the NTIA's interference calculations, nor increase the potential for harmful interference. [4]

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[2] *See* Companies' Reply Comments at 4 (expressing concern regarding potential effects "if [radar] deployment is different than what had been modeled when the UWB rules were adopted"); *id.* at 7 (expressing concern "if radar is deployed in significant numbers of vehicles" and calling for strict standards to apply to "any additional types of vehicular radar systems"); *id.* at 8 ("even if new types of vehicular radars . . . operate consistent with existing limits, they would impose limitations on the improved sensitivity that can be incorporated into next generation instruments").

[3] *See* "Assessment of Potential Interference to the Passive Sensors Operating in the 23600 – 24000 MHz Band from Short Range Radar Systems," (Attachment 2 to Letter from William Hatch, NTIA, to Edmond Thomas, OET) (Feb. 13, 2002) at 5.

[4] *See* Petition for Reconsideration of Siemens VDO Automotive AG, filed in ET Docket 98-153 (June 17, 2002) at 13.

Nothing has changed in the past year to alter Siemens VDO's assessment regarding the overall rate of vehicular radar deployment. The very first UWB radars are expected to become available on a very few vehicle models beginning no earlier than 2005 – the same year in which NTIA's compatibility analysis assumed that *every* new car would be equipped with vehicular radar. Such an assumption is grossly misleading. New automotive safety devices typically take many years, if not *decades* to reach 100% penetration of the new vehicle market. For example, airbags were introduced by General Motors in 1973.[5] In 1991, the market penetration rate for airbags was still so low that Congress passed legislation mandating full deployment by 1998.[6] Similarly, for model year 2001, the installation rate of side airbags had only reached 22.3%, and anti-locks brakes were deployed on only 61.6% of vehicles.[7] Nothing in the record in this proceeding suggests that the deployment of vehicular radar will be markedly different from the deployment of other automobile safety devices.

The primary concern of the Companies is that a significant number of vehicular radars could be deployed prior to 2010, when the 30 dB attenuation requirement for vehicular radar goes into effect.[8] However, when realistic assumptions about the rate of vehicular radar deployment over the next several years – as opposed to NTIA's hypothetical "worst case" assumptions – are applied, it becomes exceedingly clear that the concerns raised by the Companies are irrational.

Moreover, the Companies' assertion regarding potential cumulative interference levels from vehicular radars after the 2010 limits go into effect are dubious at best. First, the Companies present no data or calculations in support of their assertions, and admit that their findings are only "preliminary."[9] Second, these preliminary findings merely purport to show that vehicular radar emissions "will

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[5] *See* "Motorvista: Airbag History," *available at* www.motorvista.com/airhist.htm (visited Sept. 28, 2003).

[6] *See* 49 U.S.C. §30127.

[7] *See Ward's Motor Vehicle Facts & Figures* (2002) at 10 (data for domestic production passenger cars).

[8] *See* Companies' Reply Comments at 7.

[9] *Id.*

approach" the interference threshold, and then only in high vehicle density areas.[10] Third, the NTIA compatibility analysis already considered the operational parameters of CMIS and ATMS sensors, thereby ensuring that the NTIA-recommended attenuation levels now contained in Section 15.515(c) will provide sufficient protection for EESS.[11]

As noted above, the Companies focus most of their Reply Comments on concerns relating to the overall proliferation of vehicular radars – a topic that is not being considered as part of the *Further Notice*. By contrast, the Companies devote no more than one page to addressing issues specific to frequency hopping systems,[12] and that discussion is little more than a recitation, without any new data or independent analysis, of the proposals contained in the July 16, 2003 Comments filed by the National Academy of Sciences' Committee on Radio Frequencies ("CORF").[13] In its own reply comments, Siemens VDO has explained in detail why CORF's proposals are unsupported by legitimate technical considerations.[14] Both CORF and the Companies apparently fail to grasp the important technical distinction that the Siemens VDO radars are *pulsed* (*i.e.*, not continuous) frequency hopping devices. This is significant because Siemens VDO's pulsed frequency hopping devices produce

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[10] *Id.*

[11] *See* "Assessment of Potential Interference to the Passive Sensors Operating in the 23600 – 24000 MHz Band from Short Range Radar Systems," (Attachment 2 to Letter from William Hatch, NTIA, to Edmond Thomas, OET) (Feb. 13, 2002) at 3-4.

[12] *See* Companies' Reply Comments at 5-6.

[13] The Companies have joined in CORF's call for the imposition of a 0.1 ms integration time for average power measurements and a requirement that measurements be taken using a fast-response power detector. *See id.* The Companies fail, however, to respond to the fact that, in its Comments, Siemens VDO indicated that it would be willing to accept a 1 ms integration time for measuring average emissions in the 23.6-24.0 band, a time that, based on information contained in the Companies' own Reply Comments, is less than the integration time of any EESS sensor under development. *See* Companies' Reply Comments at 6.

[14] *See* Siemens VDO Reply Comments at 3-5.

the same emissions characteristics as pure pulsed systems and thereby present no greater threat of interference to EESS or any other service.[15]

Siemens VDO trusts that the explanations provided above will allay the misplaced concerns expressed by the Companies in their Reply Comments. In any event, there is nothing in the Reply Comments that has not already been addressed by Siemens VDO in its prior filings, and nothing that should hinder the Commission from adopting the rule changes proposed in the Further Notice that will permit Siemens VDO's pulsed frequency hopping vehicular radar devices to operate as UWB devices.

Respectfully submitted,

/s/ Ari Q. Fitzgerald

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cc: Edmond Thomas
Julius Knapp
Karen Rackley
John Reed

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[15] *See* Siemens VDO Reply Comments at 3; Siemens VDO Comments at 3-7. Indeed, for EESS sensors with a receiver bandwidth of, *e.g.*, 200 MHz, which is larger than the 50 MHz bandwidth of the FCC's standard victim receiver, the Siemens VDO radars are even less likely to cause harmful interference than pure pulsed devices operating pursuant to the 500 MHz minimum UWB bandwidth rule. The instantaneous occupied bandwidth of the Siemens VDO devices is 20 MHz, filling up only 1/10th the bandwidth of a 200 MHz EESS receiver BW. Moreover, as the pulse width is approximately 50 ns, for all RBWs > 20 MHz, no further PDCF factor applies, meaning that the peak interference in a 200 MHz RBW is the same as in a 50 MHz victim receiver bandwidth (*i.e.*, –8 dBm/50 MHz). This value is 20 dB lower than that of a pure pulsed device, which would have a peak interference that is even 12 dB higher than the 0 dB/50 MHz peak limit due to the still applicable PDCF of 20 log(200 MHz/50 MHz). Finally, for a –8 dBm peak power value and typical pulsed frequency hopping operation parameters, the average PSD is –61.1 dBm/MHz, which is about 20 dB below the FCC limit. *See* Siemens VDO Comments at Fig. 3.