

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 15 of the Commission’s) ET Docket No. 10-23
Rules To Establish Regulations for Tank Level)
Probing Radars in the Frequency Band)
77–81 GHz)
)
Amendment of Part 15 of the Commission’s)
Rules To Establish Regulations for Tank Level)
Probing Radars in the Frequency Bands)
5.925–7.250 GHz, 24.05–29.00 GHz, and)
75–85 GHz)

To: The Commission

Comments of EIBASS

Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS) hereby respectfully submits its comments in the above-captioned Further Notice of Proposed Rulemaking (FNPRM) relating to Part 15 Level Probing Radars (LPRs).

**I. Increased Power for LPRs in the 6.5 and 7 GHz TV BAS Bands
Is an Unwarranted Risk Without Additional Safeguards**

1. The Commission proposes to allow unlicensed, Part 15, Level Probing Radars (LPRs) at 5,925–7,250 MHz to increase their allowable equivalent isotropic radiated power (EIRP) by almost three orders of magnitude, from -21.3 dBm to +7 dBm. The NPRM further proposes to eliminate the Section 15.250(c) restriction against using LPRs on a “fixed outdoor infrastructure.” Without certain safeguards, to be discussed, such a power increase would be a potentially co-channel interference threat to TV Broadcast Auxiliary Service (BAS) operations at 6,425–6,525 MHz and 6,875–7,125 MHz, since both of these TV BAS bands are within the frequency range of 6.6 GHz LPRs.¹ While 6.5 GHz TV BAS operations are mobile only, the primary use of 7 GHz TV BAS is for fixed, point-to-point links, including studio-to-transmitter

¹ The geometric mean frequency of 5.925–7.250 GHz is 6.554 GHz, so EIBASS will refer to LPRs in this band as 6.6 GHz LPRs, to differentiate them from LPRs in high frequency bands that do not include TV BAS operations.

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(STL) paths. Interference to an STL is therefore serious, and demands the highest level of interference protection.

II. Needed Safeguards

2. The NPRM concludes, at Paragraph 19, that the proposed power increase and elimination of outdoor use prohibition “will not increase the likelihood of harmful interference to incumbent authorized radio frequency operations.” EIBASS disagrees. The Commission’s assumptions are based on unrealistic restrictions for the installation and use of unlicensed devices. As a unlicensed, Part 15 device, the Commission’s control over the use of the devices is far more tenuous than the case for licensed use, where the Commission has information about the user and direct jurisdiction over the user. Further, while the licensees of “incumbent authorized radio frequency operations” can monitor Commission notices for applications that could impact their operation, or search the Universal Licensing System (ULS) for stations that could be interference sources, should interference occur, there are generally no such opportunities for Part 15 devices.²

3. Because these would be unlicensed Part 15 devices the claim, at Paragraph 20, that LPRs would be “single, *i.e.* relatively isolated, transmitters whose individual operations outdoors will not result in a dense deployment of transmitters” is pure guesswork by the Commission. There must be a reason why manufacturers of LPRs have petitioned the FCC for greatly increased power and to remove the restriction on outdoor operations. For example, see the attached Figure 1, showing LPRs offered by Sutron Corporation (Sutron). Sutron was one of two LPR manufacturers identified at Paragraph 9 of the NPRM as requesting rule waivers for high power and outdoor use. EIBASS submits that there is no basis for assuming that only one high-power, outdoor LPR at a particular site would be employed.

4. EIBASS therefore suggests that increased power for LPRs that include the 6.5 and 7 GHz TV BAS bands only be allowed if 1) there is a built-in circuit to ensure that the device is stationary³ and 2) there is a built-in circuit to ensure that the transmitting antenna is, in fact, aimed downwards. That is, a high-power LPR must have circuits that will not allow it to radiate if motion is detected, or if the transmitting antenna is not within $\pm 10^\circ$ of straight downwards. It would be woefully insufficient for the only means of ensuring fixed, downward-pointing

² EIBASS realizes that an exception would be Part 15 TV band white spaces devices (WSDs), which, as noted in Paragraph 47 of the April 5, 2012, ET Docket 04-186 Third Memorandum, Opinion and Order, must be registered in a special WSD database. However, the TV WSD database would not apply to 6.6 GHz LPRs.

³ Paragraph 34 states that hand-held operation of LPRs would be “prohibited,” but especially for an unlicensed, Part 15 device this would be an unenforceable restriction.

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operation to be instructions stating that hand-held (*i.e.*, mobile) operation is forbidden and that the antenna must be installed so that it is aimed towards the ground.⁴

5. While some LPRs appear large enough to make hand-held or mobile operation unlikely, others are clearly small enough to be operated as a non-fixed location device. See the attached Figure 2 examples. Although hand-held operation seems unlikely, mobile or itinerant operation would appear to be entirely practical, meaning that a +7 dBm EIRP and potentially co-channel radar signal not aimed towards the ground could be created, perhaps by a user without any idea that improper use could cause interference to a TV station's STL.

6. Another weak spot is the proposed requirement that high-power LPRs be "professionally installed." Without defining that term a professional installation requirement is meaningless. The Commission needs to make the installation requirement enforceable, by stating the required qualification of the installer. EIBASS suggests that "professionally installed" for 6.6 GHz band LPRs be installation by a person holding Society of Broadcast Engineers, Inc. (SBE) certification at the broadcast engineer level or higher,⁵ or a person holding certification by the National Association of Radio and Television Engineers (NARTE) as an EMC Engineer, or registration as a Professional Engineer (P.E.), in any discipline.

7. The "professionally installed" requirement also means nothing unless there is a requirement to document when and by whom the high-power LPR was installed. Thus, a requirement for high-power LPRs at 6.6 GHz should be that the user must have, and make available upon FCC request, a record showing the qualifications of the person making the installation, and when the installation took place.

8. The combination of circuit lock-outs that would not allow a 6.6 GHz LPR to activate if it detects motion, or if it detects that the transmitting antenna is not aimed vertically downwards, plus a meaningful professional installation requirement would, in combination, result in a reasonable expectation that interference to TV BAS operations at 6.5 and 7 GHz would not occur. Of course, the best solution in the view of EIBASS would be to prohibit high-power LPR operation above 6,875 MHz, period, and thus eliminate the threat of co-channel interference to TV station STLs. In this regard, EIBASS notes the April 25, 2012, early filing by the National Radio Astronomy Observatory (NRAO) at Charlottesville, VA, requesting a 4 km exclusion zone around radio astronomy sites using 6.6 GHz, a larger exclusion zone of 40 km if the LPR

⁴ NPRM, again at Paragraph 34.

⁵ SBE certification types CBRE, CBTE, CSRE, CSTE, and CPBE.

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will have a height of greater than 15 meters AGL, and finally a prohibition of any LPR operation with line-of-sight to a radio astronomy station. EIBASS wonders, though, how such provisions would be enforced against a Part 15 device, even if adopted. Nevertheless, the filing shows that there is at least one other party besides EIBASS that thinks a 28 dB increase in the allowable power for a Part 15 device constitutes an interference threat.

III. The Commission Has No Control Over the Advertising of Part 15 Devices Once They Are Approved

9. At Paragraph 34, the NPRM proposes to adopt restrictions to “prohibit the marketing of LPR devices to residential consumers.” EIBASS believes that the Commission lacks jurisdiction when it comes to the advertising of approved Part 15 devices; although the Communications Act gives the Commission authority regarding the actual use of Part 15 devices, and also that a radio frequency device cannot be imported or offered for sale unless it has obtain Part 15 certification, EIBASS submits that the Commission’s authority ends there; that is, once a device has obtained Part 15 certification, it can be marketed to anyone. Even if the manufacturer of the Part 15 device has the integrity to only market and sell to industrial users (itself a vague enough term), the device manufacturer has no control over second tier distributors.

10. Thus, while EIBASS believes that the Commission lacks the authority to restrict how a device that has obtained Part 15 certification can be marketed (*i.e.*, advertised), EIBASS also believes that few residential users are going to be interested in purchasing an LPR, high-power or otherwise. It is the expanded commercial use that worries EIBASS.

IV. The NPRM’s Cost Benefit Analysis Fails to Consider the Costs to Incumbent TV BAS Licensees in Tracking Down Interference from High-Power LPRs

11. At Paragraph 37, the NPRM states “we believe that the benefits of the proposed regulations for manufacturers and users outweigh any potential costs,” but EIBASS finds no indication that the Commission considered the costs to 6.5 and 7 GHz TV BAS licensees having to track down interference from high-power LPRs. The only mitigating factor EIBASS sees is that such interference would likely be continuous, if the suggested requirement for a motion-detection lock out switch is included; that is, a high-power LPR causing interference to co-channel TV BAS operation would then indeed be stationary. Tracking down interference from a stationary, continuously radiating interference source is far easier than trying to locate interference from a mobile and/or intermittently transmitting device.

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V. Summary

12. Part 15 devices need to be fail safe. The Commission must not assume that the user of a Part 15 device will read and adhere to admonitions on how the device should, or should not, be used. The “professional installation” requirement needs to be better defined, and made enforceable by having a requirement to show to the Commission, upon request, written documentation giving the name and qualifications of the installer.

VI. List of Figures

13. The following figures or exhibits have been prepared as a part of these ET Docket 10-23 comments:

1. Pictures of outdoor LPRs by manufacturer requesting higher power limit for outdoor LPRs.
2. Pictures of LPRs small enough to be operated hand-held/mobile/portable.

Respectfully submitted,

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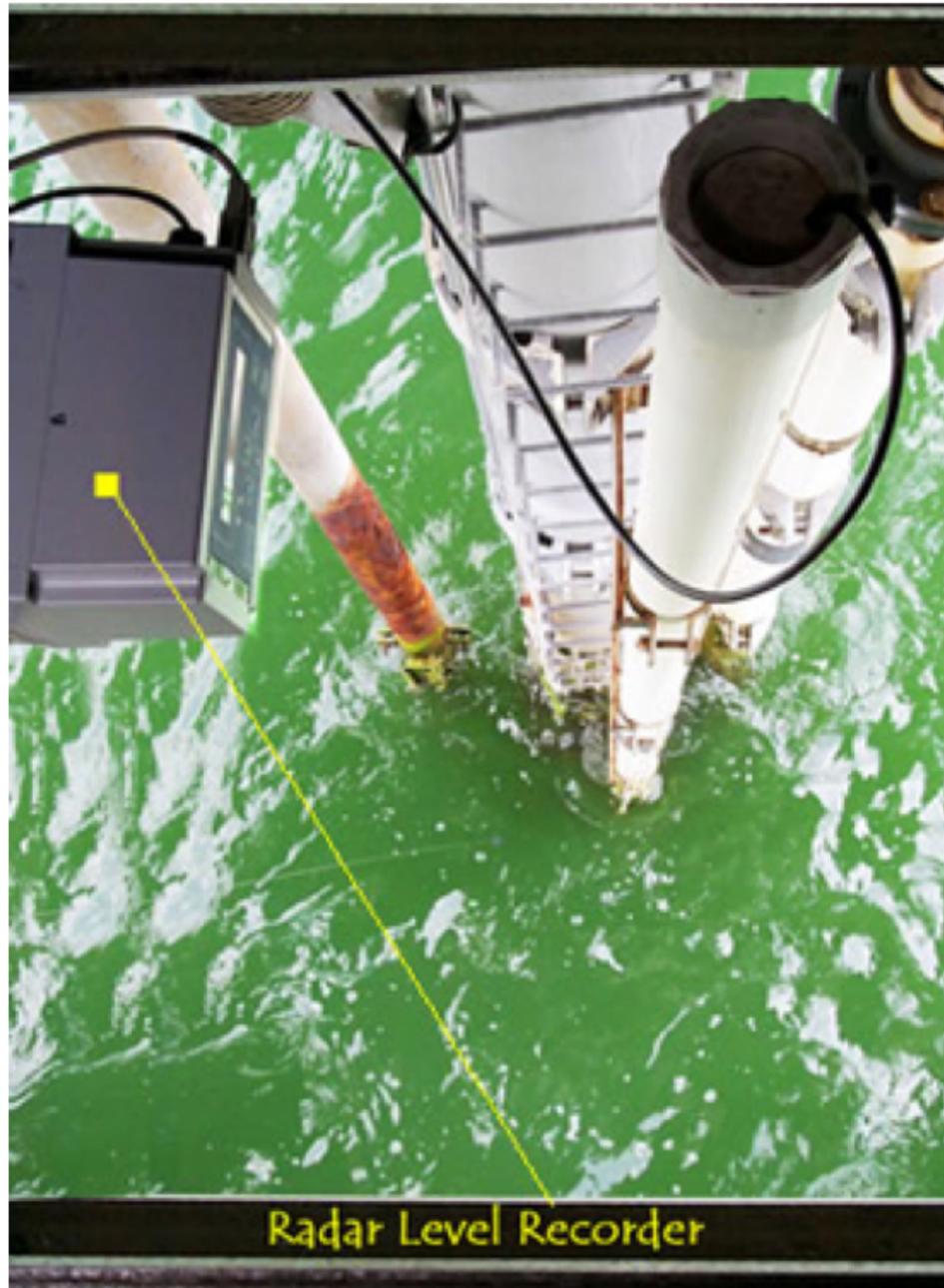
Pictures of Outdoor LPRs



Examples of outdoor LPRs. Source: Sutron Corporation web site.

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Pictures of Outdoor LPRs



Also from the Sutron Corporation web site.

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Pictures of Physically Small LPRs

© Siemens AG 2009

Level instruments

Continuous level measurement - Radar transmitters

SITRANS Probe LR

5.8 GHz LPR
weight = 4.3 pounds
length = 1.8 feet

Overview

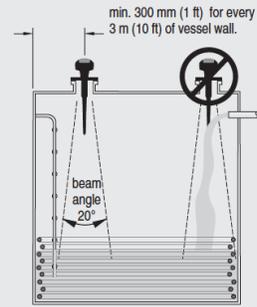


SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

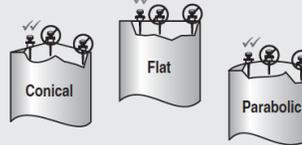
Benefits

Configuration

Installation



Mounting unit on vessel



Mounting on a manhole cover

5

Source: Siemens web site.

MODERNIZING MEASUREMENT TECHNOLOGY

PRODUCTS

Level Radar

- VEGAPULS 61
- VEGAPULS 62
- VEGAPULS 63
- VEGAPULS 65
- VEGAPULS 66
- VEGAPULS 67
- VEGAPULS 68

Guided Microwave

Ultrasonic

Capacitive

MLI/Bridle

Additional Product Categories:

- Switching
- Pressure
- Radiation-Based Measurement
- Integration Solutions
- System Components
- plics Technology
- SPEED Delivery

4170 Rosslyn Drive Cincinnati, OH 45209 USA
1.800 FOR LEVEL (367.5383) americas@vega.com

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HOME > PRODUCTS > LEVEL > RADAR > VEGAPULS 66

VEGAPULS 66

The VEGAPULS 66 provides the highest level of performance in the most extreme process conditions such as foam, build-up, condensation, agitation, and high temperatures and pressures.

It utilizes a 6 inch or larger diameter horn to focus the microwave energy toward the measurement surface. The horn also provides a large area for collecting the return signal.

Features

- 6.3 GHz low-frequency radar
- Loop-powered
- Adjustment with PLICSCOM, HART handheld or PC
- Specialty waveguides as well as a glass-lined horn available

Key Specifications

- 40° to 752°F (-40° to 400°C) operating temperature
- 14.5 to 2320 psi (-1 to 160 bar) operating pressure
- +/- 10 mm (0.39") accuracy
- 98 ft (30 m) measuring range
- SIL2 Qualified (IEC 61508/61511 Standards)

➤ **Principles of Operation**

weight = 14 pounds
length = 12 inches

Source: Vega web site.