

Comments on SAVI's request docket number 01-278

I am an amateur radio operator (KB9LGS) and a member of the ARRL. Through them I became aware of this request, and would like to join them in requesting that you reject this. I am in agreement with their comments, but will not repeat them here except where they touch on my comments. I find that this request is both technically and morally flawed.

It appears that this company is not operating in a totally moral manner. They appear to have knowingly developed a product which is in violation of the FCC rules. They proceeded to market this product, thereby generating the customer need that they are now referring to. They then bring in Bosnia and overseas military operations as being the justification. None of this is really good reasons for the implementation of this technology, and I believe that SAVI realizes this. In looking over both the radio and the data processing justifications involved here I find many technical which I will discuss later in the document. They are producing a technically flawed product and using public relations to try and hide the technical flaws of their product.

According to the filings I have seen, they have already received an exemption/rule change for this technology. It appears that the original regulations required that the system power be limited to 200 pico volts at 3 meters. Their product now apparently operates at 4400 pico volts at 3 meters. They are now requesting that new systems be allowed 110,000 pico volts at three meters. They are apparently engaged in rule creep. There is the story of how a to boil a frog alive. Dump a frog into a pan of boiling water and he will jump out and survive. Instead you simply put him in a pan of warm water. You turn up the heat till the water boils. They frog will never know what hit him. I believe this is the method that SAVI is engaged in here. One would wonder if one of the reasons for this large of jump in the power request is that they are already experiencing massive problems with the licensed services in this area, which they are claiming will not be an interference problem.

In reality they could not have picked a worse set of spectrum for the use for this function. As amateurs you allow us a great deal of leeway. We can some times use that leeway to avoid interference problems, but this would be very difficult in this case. The area of the 70cm band this company has chosen is by band plan and practice used for satellite work and for weak signal work. In both these cases we are working with very low powered signals and very high gain radios and antennas. Since the satellites have already been launched changes in this is difficult. These frequencies are also not a local choice, but a world wide choice. If we were dealing with the areas of the spectrum where we do high powered FM work, this might actually be only slightly annoying as the range would only probably been a few miles at the power requested.

This unfortunately is a weak signal area so this is not the case. Since this is a weak signal area, and the frequency changes would be very difficult to accomplish, the area of interference for one of these setups would be many miles in an urban environment. This means that about any of these installations would be interfering with

a licensed station. The only real way to stop the interference would be to shut down. The reality of the situation is that you can pretty much count that if the part 15 regulations regarding interference were followed and any place that had this system installed would not be able to operate it most of the time if at all. It seems unwise to participate in permitting the sale of a product which can not be used legally.

On the other hand as a licensed station we are in fact permitted to interfere with these installations. If a licensed station is interfering with a part 15 station and is causing it not to be able to function the part 15 station has no recourse but to live with it. It is important to look at what this means to SAVI's customers. One of the methods we might have as amateurs to deal with the problem is to increase power. Obviously this increase may very well stop the RFID system from functioning. As I mentioned this is the weak signal area. This means that the signals being received are weak. The signals being transmitted frequently are not. Much of the weak signal work consists of bouncing signals off things and engaging in other propagation means that cause a great deal of signal loss. This means that the signals transmitted by amateurs operating in this area of the assigned band are transmitting some of the most powerful signals that we do as amateurs. This means that even if the installations were not forced to shut down for legal reasons many of them would regularly be off line due to interference problems.

For some systems being off line is not a big deal, but the one point that SAVI makes that is very true is that the transportation and inventory needs of our nation are rapidly changing and the time frames involved are greatly being reduced. Certainly better support for the just in time systems out there are in the best interest of our nation. In the same manner better tracking of packages in transit are needed. But more than ever the solutions being applied need to be reliable. One customer mentioned with regard to this system is United Parcel System. Lets take a look at a probable use they would put to such a system. They have a central air hub for their overnight packages. One would assume that if they use this system anywhere they would use it here. It obviously would become important to the operation of this system. If this system were to be down for several days it would adversely effect our nation. Since under SAVI's proposal this would be inevitable, the use of this system by UPS would not be in the national interest. On a smaller scale consider the results on a "just in time" factory of the system being down and their having to send people out into the yards to open all the trucks and find the needed parts. The implementation of a system this unreliable is not in the national interest.

In normal situations the interference with the amateur signals might be of a major national interest, but we recently had a reminder of what one of the major purposes of the amateur radio service is to be ready in the case of a national emergency. During all times of emergency we are in the for front of getting things back on a normal footing. In some cases we may be the only means of communications available. In other cases, there are other means available, but we are still their providing additional needed

resources that make the response and recovery efforts work. The 70cm band is just a little behind the 2m band in the bands used for such purposes. We do have many bands available, but few are as used in emergencies as these two. One will note the 220 band where UPS is also at. It is quite interesting that while proposing this as a system that will not interfere with other radio systems, they are not proposing to use the frequencies assigned to them for this additional purpose.

Another consideration is the use of this system in the locations proposed. The proposal is to use it in close proximity to both aircraft and sea vessels. One should be giving consideration of what would happen if this unlicensed and functionally unregulated system were to be used in this manner. More and more of the control systems on these vessels are becoming computer dependant. RF transmissions can disable these computers. In fact this is one theory among many of what has happened in the crash of two different unexplained crashes of airliners. The theory in the case is a high powered transmitter many miles away. Could not the same result be gained through the transmitting of this kind of power within feet of the computers. This will not only be possible, but inevitable as the containers with the RFID "tags" will be loaded into planes and can transmit while in this location.

In addition to all of these design flaws regarding the RF systems be proposed there are serious flaws in the underlying data design that these systems are to support. One very important concept to remember is what is it that SAVI has sold to these companies is the result not the method. In a class I took on sales a few years ago they talked about what someone buys when they buy an electric drill. They are not in fact buying an electric drill, they are buying holes put any where they want them anytime they want them. This is an important concept to consider when looking that this proposal. What has SAVI sold to the customers. They have sold A solution to a problem which these customers have. This problem is tracking data about shipments. The tracking of this data in a reliable manner is certainly in the national interest, but it can be done in other more reliable ways.

Presently the request mentions 128K of data to be stored in each device. They are already indicating that this is not going to be enough. Why is this. That is because they are listing a lot more than just the container information. They would be listing every item in the container separately. This is a waste of bandwidth, and at the same time is not going to be adequate for the needs. If you really need to have all the information about everything in a container transmitted to the base you will need several meg of data. With Material Safety Data Sheets on every product in the container and other emergency data included even this will not be enough. The solution that SAVI is proposing will not even scale to the level they are proposing. It certainly will not scale to meet the need even in the short term.

According to SAVI's own filing, the current rf tagging technology allows for a container number to be handled quite nicely without the additional rules changes. A database handled through normal means could then contain the additional data. Functionally the limit

on the amount of data would be removed. In addition the data itself would reside in a safe and secure mode.

In this design the data itself resides on the container. Anyone within a few miles of the container with the right hardware would be able to download it. They would not even have to be near a equipped site. They could do this anywhere along the container's route. SAVI is proposing this as a solution for the military and other highly sensitive applications. I am sure they are planning some security for it, but given the nature of the system they are proposing there really can't be a lot of security involved. It will be simple to break. We have seen the result of computer security problems recently, it is unwise to add an additional one. Would WalMart want Kmart to have a list of every item they are shipping to all their stores. Under this system if WalMart implemented this program, Kmart could do this, and nobody could detect or track it. If all that they could gain by downloading the data was a list of the containers and by that the number of containers this would be much less valuable data.

They SAVI is also proposing that the systems be radio reprogrammable with data. Again they need the much higher power and service time to do this. Again this is very poor engineering from a security stand point. This in reality means that anyone within a few miles of the container could reprogram it. They would not even have to be within a few miles of the terminal, just the container. Think of what could happen if someone parked along the highway to New York. Located all the containers our army was sending to a battle front and rerouted them to say Mexico. With this system this could happen.

Much of the data in the request is false. SAVI refers to the frequency to be used as being in "unlicensed spectrum". It is not and the request should be bounced just on the basis of this false representation. Instead the spectrum is in fact licensed, and they are proposing unlicensed use of licensed spectrum. If they do want to use unlicensed spectrum, as they should for this application they should operate in the part 18 area as the ARRL proposes. They say they know it will not cause interference. How do they know this they have presented no studies to say this. Instead there are studies of operations of this nature in other countries that allow it which indicate that it is a major problem. They imply this is the only way that the need can be met. I have shown that this is not the case. They are claiming that this is a minor change in duty cycle and power limitations. Even a close look says that this is not the case. It is a several fold change in both. They say that they are "unnecessarily hamstrung" by the regulations, when in fact the rules are necessary for everyone's operational co-existence.

This is basically a badly engineered solution to a real problem. It will not work, and will cause much harm while people figure out it will not work. It is especially at risk in the case of an emergency and puts emergency services at risk. The only people who will be actually harmed by your turning down SAVI's request is SAVI. They will either not be able to market their product, or will have to do a proper engineering job.

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Thought for the day:

Intuition (n): an uncanny sixth sense which tells people  
that they are right, whether they are or not.

For PGP public key send message with subject  
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If this message refers to an attachment the attachment  
may arrive as a seperate mail message depending on the  
type of mail client and gateway software you are using.