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Should Public Safety Be Treated Differently From a Technical Standpoint?

This is the concluding part of a two-part series on the Washington Regulatory Panel discussion held at the 59th Conference & Exposition.

By Rick Arndt • Assistant Editor

Should public safety be treated differently from a technical standpoint? The answer from the experts ...

John Lane: I thought I heard a question, or at least an answer saying that public safety should be treated differently. Did I gather from that that you meant from a technical standpoint?

Ralph Haller: I think that the basic two-way radio standards will be the same, but the point I was trying to make is that I think you may well develop things that are very non-standard, and put those into the patrol cars to perform very specialized kinds of functions. And I think that the refarming operation should give you the flexibility to use wider bandwidths for these kinds of special needs.

John Lane: Don Speights, you have your own refarming under way in the Executive Branch ... why don't you bring us up to date as to what NTIA is doing as far as splitting channels is concerned.

Don Speights: Ours is considerably easier to do than what's being done at the FCC. Number one, we have exclusive use already, so that's not an issue. We don't have any antenna and power restrictions, so that's not an issue. We all operate under one service -- that becomes a non-issue. All of our assignments from the federal government are done around one table in Washington D.C., so that makes it easy to coordinate -- that's not an issue. And all of our customers have agreed to all the rules that we have set, and that makes it a lot easier to refarm.

Unfortunately, we're kind of married to the APCO 25 standard right now. We have established our rules for our VHF and our UHF band to begin refarming in 1995. And, we're working very closely with APCO 25 to see that that happens in that short period of time. I'm not saying all of our federal agencies will use APCO 25-type radios, but most of our public safety agencies will. The rest of them will likely go with narrow-band FM radios. We're kind of killing two birds with one stone.

Correction

In the last issue the following was listed among the highlights of the Washington Regulatory Panel discussion:

- Look for a channel split at 800 MHz in two to three years.

That is NOT correct.

And in the body of the newsletter was the following:

- in as little as two or three years, the FCC will be looking at least at a channel split at 800 MHz.

That is NOT correct. That is a quote of what Private Radio Bureau Chief Ralph Haller said in answer to a question; however, he did not mean to say "channel split" ... he was talking about the use of offsets in the 806-820 MHz band and he gave as an example the County of San Bernadino situation. The correct information and answer to the question from the audience is that the FCC may begin to look at refarming above 512 MHz within the next few years.

I want to say that NTIA is 100% behind APCO (Project) 25. We hope, though, that something happens very shortly, both within APCO 25 and with the FCC, to decide which technical way we are going to go because we've already adopted 12.5 kHz bandwidths, and we are counting on that particular technical solution for our problems.

Bob Gurss: Does it still make sense to have now 20 radio services? What are some of the advantages that each of you see of the current system, or some degree of consolidation? And I'll throw in my follow-up right now so you can anticipate it: How does that impact on frequency coordination?

Ralph Haller: The services were put in place for a reason, and ... many of the uses of the radios are so tremendously different between services. When we start talking about consolidating pools, consolidating a number of radio services, I think that has to be done as a very delicate step. And I think we have to know what we're doing, or we stand the potential to cause a tremendous problem.

Sharing Frequencies With Veterinarians and Beach Patrols

For example, if we were to make a public safety pool that included police and special emergency, you could be sharing frequencies with veterinarians and beach patrols. I'm not sure that's such a good idea. We must look at that whole issue very carefully. Then, and only then, can we come back and answer the second part of your question as to what happens to coordination.

If it makes sense to go to fewer coordinators, we might do that. But, even there, I think we run into problems. I'm not sure -- I guess this is a little backwards here because APCO, being a major coordinator, is likely to remain no matter what. But I think there are public safety entities out there that have their own coordinator right now that knows the very special needs of that particular industry. That would be very uncomfortable with having APCO do the coordination,
because they simply would feel that APCO did not understand their needs, and therefore could not coordinate as well.

Tough issues ... and they are not issues that have been decided yet. The fact that we have proposed the consolidation -- it's not a done deal. And I don't know what the answer is yet. There is some general agreement in the comments to go to probably four or five pools. And to the extent that we can maybe make some sense out of that, we'll see what we can do.

But there's not a lot of consensus on the record as far as decreasing the number of coordinators. We will try to make a reasoned policy call there, but I couldn't tell you today what it's going to be.

Brian Fontes: I think what Ralph said is a fair assessment. Just keep in mind that these services were in place for a number of years, each one with its own constituency. And each one, then, represents that constituencies' interests to the agency. And there's a reason initially for these pools for separate services. I couldn't underscore more than Ralph has already indicated that we have to look at this very, very carefully. And I definitely think the coordinator issue will shake out once you make the initial decision.

John Lane: If refarming is so good for the pieces of land-mobile spectrum that the Commission has jurisdiction over, why isn't it a good idea to expand this to the other radio bands in light of new technology: compression, digital, modulation techniques, etc. This is the third time that I have in my time witnessed the splitting of the private radio channels. I don't recall any splitting or any increased usage of other bands in the spectrum.

Tom Stanley: You could argue even refarming isn't new. People have been splitting channels for some time, as you had mentioned. I would like to think that virtually all the services we are looking at currently really are going through sort of next-generation birth pangs ... even the broadcasters.

We are basically requiring that they put their increased-quality service in the same band they have currently. So, in effect, broadcasters have found a way to double the capacity of their existing UHF and VHF bands. Will they keep the other half? Certainly the prevailing view at the Commission currently is "No." So here is one example, John, where an industry has doubled the efficiency of its bands, or of its capacity.

John Lane: The trouble is they haven't done it yet.

Tom Stanley: We have to wait, I think.

John Lane: They're not going to be forced to do it by December, either.

Tom Stanley: More like the next century sometime. I think you're correct, though, in terms of increased -- let's pick digital as an example -- as things have gone digital -- it's funny, digital used to mean "inefficient" because digitization meant frequently just sampling, and ends up spreading the bandwidths. But now digital means, of course, increased frequency use in almost every area.

You see this in cellular. Cellular, in effect, left to its own devices, has an embarrassment of riches in terms of alternative standards that triple, or multiply by five, or even 10, 20, the efficiencies of the bands. So, in a sense, almost everything we're looking at is going through this kind of efficiency increase.

How Do You Fix a Locomotive While It's Still Moving?

The problem -- and this is where I think refarming has kind of taken a very difficult problem on: How do you fix a locomotive while it's still moving? (still a very important practical part of the economy) -- and one answer is, of course, you take it apart a piece at a time, and hope that it still stays on the track.

There are other approaches. Refarming, in a sense, used to mean "greenspace" -- that if there were a virgin hunk of territory somewhere, that one would stop licensing in the old band, and start licensing in the new, and find some economic incentive to have people move to the new band, and thereby opening up those precious downtown blocks of real estate. I'd still press with that in some areas. I hope that we can find an economically-based way of refurbishing lower frequencies. Maybe what we're trying to do with 2 GHz is a harbinger of that.

Ralph Haller: I think you have a classic example of government regulation. The broadcasters are using 1940s technology today because they're mandated to do it. And, in many cases, the individual broadcasters would like to do something else, but our rules have not let them. They're trying now with the high definition to get a lot more information in a similar bandwidth.

But it's only been very recently that they've really been given the opportunity to do that. I want to be very careful of on refarming ... we don't (want to) lock this land-mobile community into the same kind of problem where you make a decision today and it locks you into a particular technology for the next 25 or 30 years without any choice.

Bob Gurss: Don ... are there some opportunities, and should there be more opportunities, for state and local government users

to share spectrum with federal government users who are, after all, often doing the same things out in the field, and sometimes even need to work together?

Don Speights: Like Ralph said earlier, I also went to the Voodoo Shack, but I went this morning, and they told me not to answer that question. Honestly, we currently do share, to a certain extent, in our VHF spectrum -- about 8% of our assignments are shared with state and local government. That includes hydro -- there's a good bit of that. Our UHF spectrum is shared to a certain degree. We're looking at 220 to 222 megahertz -- obviously, you're aware we're sharing that spectrum, or the FCC is sharing that with us, however you want to look at it.

We also have rules on a daily basis to share our spectrum with state and local agencies that are operating with federal agencies -- federal law enforcement agencies, or drug interdiction, or for any particular federally organized event. Unfortunately, the feds don't have as many radios as the state and local people to hand out to the state and local governments, so it ends up that we generally share your spectrum more than you do ours.

We're Exploring Sharing More Of Our Spectrum With State and Local

And, most importantly, as part of what we're calling the NTIA Mobile Spectrum Efficiency Plan, and we're reporting to Congress by 1 October -- we're exploring, on a very fundamental basis -- eventually it will be a lot more detailed -- we're exploring sharing more of our spectrum with state and local. That's one of our items that we will report back to Congress.

I promise that, in the future, we will look deeper into that subject. Unfortunately, we have only -- other than 30 to 50 MHz -- we only have two land-mobile bands, and we share those with our fixed operations too. So, it's going to be difficult, but we will address it in the future.

Bob Gurss: ... regarding 2 GHz, I was wondering if, Tom, you could explain what the Commission did, because it was very recent, and why.

Tom Stanley: ... What we've tried to do last year is -- to have a license in this area is a very valuable thing, and we wish really to preserve this situation for public safety users -- I'll take my life in my hands and say, true public safety users. It's very difficult to go to our rules, or at least it was a year ago, and say, "All right, who exactly are public safety users?" And we can basically say, You don't have to relocate. You can stay where you are. You can choose to leave if you want to, and there are great benefits to leaving. If you don't...you won't have to...if we so require it.

I'm told our rules really didn't make it easy for us to say who is a public safety user and who isn't. In fact, it was easier to come under a blanket statement for state and local government, and we're told many of the public safety entities are included under that.

Well, two or three weeks ago, we took our final cut at what that definition is. And so, we identified three or four very specific sections of the rules that currently identify facilities of police, fire and one or two others, and said, for these facilities, where the majority of the communications are for safety of life and property, the Grandfathering Clause holds. And, to go further than that, we identified anyone else who really felt they could come to the Commission and make a showing, that these facilities were used, in principal part, for safety of life and property, the Commission would again so include them in the grandfathering. We're trying to narrow and be more specific ...

Bob Gurss: Let me give you an example, and if you can, explain how the Commission would be able to, if you can do so. I should note that Tom's answer may be a little constrained, because the document is not out yet.

Let's say a forestry service -- and we've got a number of people here who are involved in forestry conservation -- has a microwave system, and they're using it essentially for fire, or law enforcement on state and local property. And, they're badge-carrying people under most people's definition of public safety and under the Private Radio Bureau's definition.

What will they need to do to make sure that they are entitled to this grandfathering?

Tom Stanley: ... Clearly, they would not qualify under what I've called the specific identification of parts of the FCC rules. However, if they can make a showing that their facilities are used in majority or in principal part for safety of life and property, they basically pass the test.

John Lane: There's one portion of the band that you are freeing up at 2 GHz for unlicensed and unregulated communications providers, such as LANS and wireless PBX. They have now come in with the claim that they cannot exist with a grandfathered public safety system. Does this present new problems to the Commission?

Public safety, of course, feels it is a priority user under any rational scheme. And, therefore, if you have unlicensed and unregulated people running around, public safety doesn't feel that it should accommodate them. It doesn't make sense from their standpoint. I just wondered if you have any comment on this development?

Tom Stanley: ... It's probably a fact that devices like palm-top computers and a variety of phones -- if you wish to use them anywhere in the country, and there are a handful of microwaves that really can't physically coexist. If you get in the main beam, you can't share. Then, yes, there is a real technical problem.

The question is, is that a real one? Some of the these frequencies, for example, we're told, and our preliminary look shows -- they're nowhere on the East Coast, where enormous population centers are. Just because those frequencies may be used in Montana, does that mean we can't, or they can't sell computers in New York City?

The answer is "No." Now, they may have their desires as to have a nice clean slate coast to coast, but then again, you don't always get what you want.

We're Trying to Be More Specific In Order to Be Very Clear ...

I'm fairly optimistic because, as I mentioned earlier, we are holding on to our grandfathering. We're trying to be more specific in order to be very clear that we do need to, quote, "not hold a gun to the head" of true public safety users where the frequencies are used for the safety of life and property. And, to be as clear about that as we can, but we, at the same time, hold up the potential -- and we've seen examples of this on both coasts -- we're really faced with the potential for new physical facilities significantly better than the former, probably more reliable, certainly more capable in a variety of areas.

And, the kicker is, and someone else is paying the bill -- why would someone want to stay? I don't see how any public safety entity in the country would want to hold out in that particular case. So I'm fairly optimistic.

John Lane: Do you think the problem will take care of itself?

Tom Stanley: I think the chemistry is all in the right direction. We're not forcing anyone. We're basically held to the grandfathering of public safety entities. There are great benefits to somehow this what I call peaceful revolution.

Brian Fontes: Let me just throw in another idea. In the event that we really do have to have a certain block of spectrum where there are no incumbents, we may have to provide some variations on the theme of grandfathering, so that if you are in that band and you are public safety, you may try to work out a situation where, at no cost to you -- again, keep in mind, all of this is at no cost to you -- that you are relocated within the 1.8 to 2.2 GHz band -- if that is, in fact, a situation that may require some relocation. We're still doing an assessment on that.

Again, there will be no cost to public safety. There will be no change in the integrity, the robustness of your system. The bottom line is that we're not out to harm public safety services.

At the same time, too, we're trying to do what I mentioned earlier, and what other countries are doing, is looking at their spectrum, and trying to figure out where changes in the allocation scheme can be made to accommodate new services desired by the public and made available to the public. Oftentimes, as you well know, this creates a very difficult situation, at least from your perspective and as well as ours at the federal regulatory side, in trying to accommodate both interests without any harm.

John Lane: Brian, I think we understand and appreciate the problems you're faced with. We just want to make sure you understand our concerns.

Brian Fontes: Absolutely. I rely on public safety services myself. The last thing I would want to do is create any problems with my need for public safety services.

Bob Gurss: Aside from what we've already discussed, are there any other areas where we could find some spectrum to provide the kinds of services we'll be using 10 years from now -- the mugshots, the video, the things that we don't even know are out there yet -- any thoughts on that from anybody?

Mobile Satellite Services Called An Opportunity for Public Safety

Brian Fontes: I think there clearly are. I look at mobile satellite services as one opportunity to provide information to public safety service entities anywhere, anyplace, in real-time capability. Of course, there's the cost factor involved in this, and that's yet to be determined ... whether you go with the a geostationary system or a LEO (low-earth orbiting) system.

I certainly hope that there are opportunities for public safety to benefit from these types of technologies. And, certainly, it's looking at using spectrum that's not currently used by public safety services.

Additionally, as we look at broadcast spectrum down the road, and the opportunity to either eliminate the taboos as we move to a digital world, or at most, to reclaim the additional six megahertz the broadcasters will have in an interim time period -- that would be a significant potential for a block of spectrum being reallocated from an existing service to new services.

Bob Gurss: What about allocations for private uses. You mention satellite, which has some significant uses. One of the problems of PCS is that it's designed right now, and it's regulated more or less as a carrier service. Public safety has problems using carriers.

Is there some potential for some private allocation, say in the 2 GHz band even, for private licensing of emerging technologies?

Brian Fontes: I understand and appreciate public safety's concern about being in control of their spectrum -- but, I don't think you should rule out the opportunity of using a carrier's spectrum, particularly as we move toward satellite distribution. ... I think there should be a healthy mix ... in the 1.8 to 2.2 GHz band we're not using all that spectrum for personal communications services. So there, perhaps, would be some opportunity to look at spectrum for other types of services.

In part of the legislative package where we now have to do this study, we're going to have to do some assessment of what spectrum is available, what your needs will be, how those needs will in fact be met. So I think through that process, which will require an 18-month time lag before we have to report to Congress, we hope to, in fact, be answering that very question.

Bob Gurss: One other question. Recently, there were some applications filed for experimental authorizations for some of these new technologies we've been talking about: wireless, local area networks, and wireless PBXs, on public safety spectrum -- at least the experiments would be on the 800 MHz NPSPAC channels.

Many people in this room, I think, are aware of that. I was wondering if Ralph, representing the Private Radio Bureau, and Tom, representing the bureau that handles experimental authorizations, might want to address the policy on dealing with experiments on public safety frequencies.

Commission Tends to Be Very Generous With Experimental Licenses

Tom Stanley: We tend to be very generous with experimental licenses. The rule of thumb is: if you're not going to interfere with anyone, and you're not going to dupe the public into buying an experimental radio that they grow to depend on -- which is turned off after three years and they get upset -- then we see very little reason to deny a university, a company, or virtually anyone's use of the electromagnetic spectrum.

So, again there's two -- and I almost forget satellites, because they're a little messy -- as long as you don't interfere, and the public isn't harmed by this experiment, we're really very generous, because one has absolutely no rights with an experimental license. You can be turned off virtually instantly, without a hearing, on the least whim of the Commission, given that there's an interference situation.

So, when someone says to us, "We have a scheme that won't interfere, they'll never know we're there, and we'll use certain areas," we take a look at it, we don't swallow that wholesale. And if we think, basically, the technique probably won't interfere, the public isn't going to be harmed, we say, "Go for it."

We make it very clear that, especially if public safety or other entities are involved, we require that various parties be notified, generally, as conditions of license. And, if anything happens, we are supposed to be the first to know.

Henry Richter (from the audience): I'm Dr. Henry Richter from California. Channel splitting looks like a great way to get many more frequencies, and it is, but information theory says there's a point of negative return pretty soon. I have not done the calculations, I wish I had. My feeling is that 12, 10, 9 kHz -- as you reduce bandwidth and reduce modulation, you begin losing. I think really the criteria you should look at -- maybe OET has done this -- is how many mobiles per megahertz per square mile you can get after you've done your channel splitting -- mobiles per megahertz per square mile.

Tom Stanley: We have not done a study at this point. That's why I was mentioning earlier -- these are trade-offs between quality and interference.

And, there's no real answer. I think, if you go back say maybe 10 or 15 years, you'll see that the kinds of bandwidths that people are now using for digital communications were not even usable at that time ... it's astonishing how far communications science has come in this brief period. Your comment on information theory: it's all signal-to-noise. If you basically can continue, you can put in an enormous amount of information, as long as signal-to-noise is on your side.

Mike Borrego (from the audience): Mike Borrego with the State of Colorado Division of Telecommunications. In Colorado, we're on an accelerated planning schedule to develop a statewide, state and local government APCO 25 network.

It seems to us that it makes more sense both for spectrum efficiency and taxpayer dollar efficiency, rather than to build two backbones (one for state and local government) one backbone for everybody. Have you looked at that possibility, and what potential exists there?

Ralph Haller: We would have no trouble licensing a system for both. We've got a number of things, like, make the federal government eligible, and users on SMR systems, and would encourage that kind of sharing to the extent that it can go both ways, to the extent that our licensees can share spectrum on a federal system, or vice versa.

We would be happy to do that ... under the new act that was just passed, if you are going to use federal spectrum, you must be an FCC licensee. And, you must pay.

APCO Past President Sam Gargaro (from the audience): What's the current thinking at the bureau regarding the interim standard of FDMA as it pertains to the issue of TDMA. It's in reference to Project 25.

Ralph Haller: I would say that APCO responded in a very diligent manner to the Commission's Notice of Inquiry on interoperability. And, we desired not to dictate what that standard ought to be, but rather, let the industry develop its own.

The (APCO) committee has done a tremendous amount of very fine work. I would not want to second-guess that. I know you have an issue right now in TIA as to whether TIA will adopt your standard and then whether, as a result, that becomes an ANSI standard. I would urge the industry to work that out on its own. I can't take a position beyond that.

But, if you develop a standard at APCO, from a Commission standpoint, it need not have ANSI concurrence for you to go ahead and use it. ... I know that a lot of your communications tend to be simplex communications.

TDMA systems require a master clock, or a master repeater, and, it's not clear to me, not being a technical expert, it's not clear to me how you make TDMA work in all your applications.

Again, you, who are the experts, have to make those decisions, and not really look to us for that.

Why Not Stop Allowing Commercial Encroachment on Public Safety Channels?

APCO Executive Director Ronnie Rand: ... has it ever occurred to the Commission that maybe they should not allow commercial encroachment on public safety channels? And then we might not have to come back so often, spending time and money, both ours and the Commission's, to try to resolve these issues. ... if we were to prohibit commercial encroachment of public safety channels, it would give us a much longer working time between when we need additional spectrum.

Ralph Haller: I think competitive bidding is going to certainly help in that. But, again it raises the issue of how do you get the spectrum. How do you compete with somebody who's doing it through competitive bidding?

I don't know how much encroachment there really is on most of your frequencies. Certainly, in the general pool at 800, that's being eaten up for commercial purposes. We're not letting anybody into the so-called NPSPAC frequencies. ... The point that public safety is less able to share is a point that is well taken.

... On the one hand, I've got to take the position of encouraging spectrum efficiency, good use of the spectrum, and not letting public safety stockpile it, just because it's public safety. On the other hand, I also do not think that it's appropriate for you to have to compete for spectrum in the same way as the private side. If there was never a single commercial use of radio, that would be fine, as long as public safety had it.

Because public safety has to be there first for our society to exist. ... The point is well taken, and we will try our best to make sure that you have the frequencies you need.

Brian Fontes: Let me just add a little bit to that. I think it is the interest of public safety and land-mobile services in general that has been the key point in the existing Commission to make sure that spectrum reclaimed from the broadcast industry is, in fact, reclaimed.

Additionally, as we look at new frequencies, that we will be able to hopefully gain sooner rather than later from NTIA, I think there's clearly a good argument for some spectrum for public safety services. Certainly, I think it would be very helpful if we had some spectrum in the adjacent band -- to PCS for public safety -- to allow for the transition, or moving out the incumbents, or, better yet, just to provide the additional spectrum that is needed. There's no question.

Moving Off 2 GHz to Some Place Else Could Be Difficult If Not Impossible

APCO President John Powell: I did a lot of research as we prepared our comments on the 2 GHz issue last year. One of the things I did was to look at spectrum use in the major metropolitan areas. I specifically remember New York, and more specifically San Francisco. And in the San Francisco Bay area, every single channel in the channel plan for the 2 GHz band within 50 miles of the coordinates for downtown San Francisco is used at least five times by a public safety licensee within that 50 mile radius.

Some areas that we have, due to environmental concerns, or other reasons, (agencies) on 2 GHz, it would be difficult if not impossible to move them some place else. Can I get your comments?

Tom Stanley: Again, circuits used specifically for safety of life and property -- the Commission has again tried to clarify exactly what's involved there. Interesting you should pick those areas. Other frequencies, like 6 GHz, still function very well in the San Francisco area.

And many of those distances are easily covered by other frequencies. So the technical capability is there. And, I suspect -- especially because of San Francisco -- there will be strong entrepreneurial pressure to relocate, where money should be no object to that. I'd be fairly optimistic about something like San Francisco. In hot, wet areas like Louisiana, maybe not.

Question from the audience: If you were the operator of a

1000-unit conventional VHF radio system today, would you replace it with like equipment with refarming coming?

Ralph Haller: I would go ahead and plan your systems ... if you're ready to replace a system today, and you're content with the capabilities you can buy with today's radios, I would replace them ... There will be a point, probably, at which you may need to make some changes ... But it should be well after you have received a good return on today's investment.

Don Pfohl (from the audience): Don Pfohl, City of Mesa, Arizona. In the Western United States, certainly there are tremendous numbers of state users who use 2 GHz microwave in support of forestry conservation and highway maintenance activities which, historically, have been judged in every way to be public safety.

I really dislike hearing the "true public safety definition" ... in every way, there are law enforcement officers out doing game law enforcement, and doing wildfire control, and all of those things.

There were many of us who commented in refarming that we thought that public safety should be carved out into a separate section of the rules, to get away from some of the problems in formulating rules ...

Tom Stanley: ... unfortunately, the Commission doesn't have a clear, bright line to what our services are that are strictly for the safety of life and property for the majority of the time. I guess we haven't had to use it. We're just using it in this one case for not being required to relocate from 2 GHz to other frequencies.

It doesn't reach any other aspect. It's not sort of a slander in any way. It's simply trying to provide some specific protections for those that we feel probably could justify that, and shouldn't be forced to negotiate to have someone else pay the bills to move them.

So, in a sense, it isn't pushing someone out into the cold. It's an attempt, in effect, to redress the Commission's own fuzzy definitions.

Ralph Haller: I would mention it doesn't change eligibles for the public safety plans, and that kind of thing. It is a very narrow decision which I do not believe redefines public safety. I think public safety is defined fairly clearly in Part 90 of the rules, at least in terms of eligibility -- sub-parts B and C -- B being certainly the higher priority, with the Emergency Medical Service in it now.

In terms of eligibility for licensing, I don't think there are questions. This was a very narrow decision, which did not reach beyond the grandfathering issue. ■

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