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# THE LIGHTSQUARED NETWORK: AN INVESTIGATION OF THE FCC'S ROLE

## HEARING

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

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# THE LIGHTSQUARED NETWORK: AN INVESTIGATION OF THE FCC'S ROLE

**FRIDAY, SEPTEMBER 21, 2012**

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
COMMITTEE ON ENERGY AND COMMERCE,
*Washington, DC.*

The subcommittee met, pursuant to call, at 9:33 a.m., in room 2123, Rayburn House Office Building, Hon. Cliff Stearns (chairman of the subcommittee) presiding.

Members present: Representatives Stearns, Burgess, Blackburn, Bilbray, Griffith, and DeGette.

Staff present: Ray Baum, Senior Policy Advisor/Director of Coalitions; Karen Christian, Deputy Chief Counsel, Oversight and Investigations; Andy Duberstein, Deputy Press Secretary; Neil Fried, Chief Counsel, Communications and Technology; Kirby Howard, Legislative Clerk; Brian McCullough, Senior Professional Staff Member, Commerce, Manufacturing, and Trade; David Redl, Counsel, Communications and Technology; Alan Slobodin, Deputy Chief Counsel, Oversight and Investigations; John Stone, Counsel, Oversight and Investigations; Daniel Tyrrell, Counsel, Oversight and Investigations; Alvin Banks, Democratic Investigator; Tiffany Benjamin, Democratic Investigative Counsel, Oversight and Investigations; Shawn Chang, Democratic Counsel; Brian Cohen, Democratic Investigations Staff Director and Senior Policy Advisor; Kiren Gopal, Democratic Counsel; Roger Sherman, Democratic Chief Counsel.

Mr. STEARNS. Good morning, everybody. And let me start the Oversight and Investigations Subcommittee this morning. And I have my start with an opening statement.

But I would say because the House is having some early votes this morning, I ask unanimous consent that the written opening statements of all the members be introduced into the record.

Without objection, the documents will be entered into the record.

## OPENING STATEMENT OF HON. CLIFF STEARNS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

My colleagues, today, after 8 months of investigation, the Subcommittee on Oversight and Investigations will examine the Federal Communications Commission's decision and orders relating to LightSquared and the Commission's efforts to build a wireless mobile broadband network.

The controversy regarding LightSquared and its efforts to build a national wireless broadband network revolves around a piece of

spectrum called the L-band. This band of spectrum has historically been reserved for satellite services. In 2003, in order to encourage more efficient use of the band, the FCC issued an order permitting mobile satellite service providers to integrate an ancillary terrestrial component or land-based component into these networks as long as they met certain requirements.

Since that time, LightSquared and its predecessors have been involved in multiple proceedings before the FCC involving the development of its terrestrial component. During these proceedings, LightSquared reached agreement with GPS companies about "out of band emissions" that may result from its terrestrial-base stations and invested approximately $4 billion in its network. In March 2010, the FCC approved the transfer of SkyTerra's L-band licenses to LightSquared, enabling the company to deploy a nationwide broadband network. This transfer was conditioned on LightSquared meeting an aggressive build-out schedule and agreeing not to provide service to the Nation's two largest wireless carriers.

In January 2011, the FCC granted a conditional waiver allowing LightSquared's customer to access its network using devices only capable of receiving terrestrial signals. The waiver was conditioned on LightSquared resolving an overload interference issue raised by the GPS community. These interference issues were a different technical concern from out-of-band emission problems that had been raised by the GPS community in a prior proceeding.

A Technical Working Group was formed to examine the overload interference issues affecting GPS receivers. NTIA later charged PNT ExCom with validating the testing. In February, NTIA concluded that LightSquared's system would cause unacceptable interference to GPS. Only 1 day later, the FCC moved to revoke its conditional approval of LightSquared's plan to build a 4G wireless broadband network leaving the company and spectrum holdings in regulatory limbo.

That is where we stand today. LightSquared, a company that committed billions of dollars and years of time in developing its network, has filed for bankruptcy. Its 40 megahertz of spectrum is left unused at a time when demand for wireless service and broadband is exploding. We have convened this hearing today to determine whether this could have been prevented.

This hearing also raises important implications for spectrum policy going forward. Regulatory uncertainty at the FCC will deter new innovative ideas and competition in the mobile space. Moreover, it is not sound spectrum policy to allow 40 megahertz of spectrum to sit fallow, while at the same time seek to relocate broadcasters and Federal users off of spectrum holdings to free up more space for wireless use.

So I look forward to the testimony of our two witnesses today.

[The prepared statement of Mr. Stearns follows:]

**Oversight and Investigations Subcommittee Hearing**
**"The LightSquared Network: An Investigation of the FCC's Role"**
**By Rep. Cliff Stearns**
**Friday, September 21, 2012**
**(743 words)**

Today the Subcommittee on Oversight and Investigations will examine the Federal Communications Commission's (FCC) decisions and orders relating to LightSquared and the company's efforts to build a wireless mobile broadband network.

Since February, the Committee has been examining the LightSquared matter. Committee staff has been briefed by and received thousands of pages of documents from the various parties involved, including LightSquared; the FCC; the National Telecommunications and Information Administration (NTIA); the groups who performed the testing of LightSquared's system, including the "PNT ExCom,"; and the various GPS companies.

The controversy regarding LightSquared, and its efforts to build a national wireless broadband network, revolves around a piece of spectrum called the "L band." This band of spectrum has historically been reserved for satellite services. In 2003, in order to encourage more efficient use of the band, the FCC issued an order permitting mobile satellite service providers to integrate an "Ancillary Terrestrial Component," or land-based component, into these networks as long as they met certain requirements, called "gating criteria." Chief among these criteria was a requirement that MSS licensees maintain an "integrated" satellite/terrestrial service.

Since that time, LightSquared and its predecessors have been involved in multiple proceedings before the FCC involving the development of its terrestrial component. As the FCC docket and the documents produced to our Committee show, LightSquared requested a number of technical modifications to its ancillary terrestrial component authority. During these proceedings, LightSquared reached agreements with the GPS companies about "Out Of Band Emissions" that may result

from its terrestrial base stations and continued to move forward with its plans to develop its network, investing approximately $4 billion to do so. In March 2010, the FCC approved the transfer of SkyTerra's L-Band licenses to LightSquared to enable the company to deploy a nationwide broadband network. This transfer was conditioned on LightSquared meeting an aggressive build-out schedule and agreeing not to provide service to the nation's two largest wireless carriers. Once again, as part of this transfer, LightSquared negotiated with the GPS companies to address the potential for out-of-band emissions resulting from the deployment of its network.

In January 2011, the FCC granted a conditional waiver allowing LightSquared's customers to access its network using devices only capable of receiving terrestrial signals. The waiver was conditioned on LightSquared resolving the overload interference issues that were raised by the GPS community. These interference issues were a different technical concern than the "Out of Band Emission" problems that had been raised by the GPS community in prior LightSquared proceedings.

A Technical Working Group, comprised of LightSquared, the GPS companies, and various federal agencies, was formed to examine the overload interference issues affecting GPS receivers. The NTIA also charged an interagency group, known as PNT ExCom, with validating the testing performed by the Technical Working Group. In February of this year, after receiving the test results, NTIA concluded that LightSquared's system would cause unacceptable interference to GPS. The following day, the FCC moved to revoke its conditional approval of LightSquared's plan to build a 4G wireless broadband network.

This is where we stand today. LightSquared, a company that committed billions of dollars and years of time in developing its network, has filed for bankruptcy. It's 40 MHz of spectrum is left unused at a time when demand for wireless services and broadband is exploding.

We have convened this hearing today to determine whether this could have been prevented. Did the FCC processes work appropriately? Should concerns about interference have been raised earlier by the GPS companies? When the FCC issued orders expanding the use of terrestrial base stations in the L band, should it have anticipated that interference would be an issue? What impact does the National Broadband Plan, and consumers' desire for broadband, have on the development of the L Band? Will interference issues continue to be a problem as providers expand broadband networks?

This hearing today raises important implications for spectrum policy going forward. Ms. Mindel De La Torre, Chief of the FCC International Bureau, will address the FCC's regulatory processes and decisions with respect to LightSquared. Mr. Julius Knapp, Chief of the FCC Office of Engineering and Technology, will address the technical issues presented by LightSquared's application and the concerns raised by the GPS community. I look forward to their testimony.

I recognize Ranking Member DeGette for her opening statement.

Mr. STEARNS. And I recognize the ranking member, Ms. DeGette, for an opening statement.

Just a moment. I think we are going to just take 5 on this side and 5 on your side.

So I will go to Dr. Burgess.

**OPENING STATEMENT OF HON. MICHAEL C. BURGESS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS**

Mr. BURGESS. I thank the Chairman for yielding.

I thank the witnesses for being here today. I am grateful we are having a hearing. I know my constituents appreciate it.

So the expansion of the 4G cellular networks to a portion of radio spectrum traditionally reserved for mobile satellite communications would improve mobile satellite communications and benefit U.S. consumers needing more brandwidth for communication.

But somehow somewhere along the way things went off track. The FCC obviously has the obligation to be the caretaker of the electromagnetic spectrum. The question is raised, did they do their job? A decision to grant LightSquared the conditional waiver order on January 26, 2011, does seem to be ill advised. The period for public comment before the granting of the conditional waiver order was brief, and whether it was intentional or unintentional, it was placed in the middle of the holiday season the year before. Requests for an extension of the period for comment were not honored and a decision was made in haste over the objections of the United States Air Force and the GPS industry itself.

Benjamin Franklin said, haste makes waste. In the operating room, we have a saying, go slowly, I am in a hurry. This time it seems that haste was in fact the enemy of good decision making. The FCC attempted to address the concerns in the formation of a government and industry working group, but the solutions have not proved up to the task. I hope today's testimony will shed light on these events.

Mr. Chairman, I thank you for the recognition. I yield back.

Mr. STEARNS. I now recognize the ranking member, Ms. DeGette.

**OPENING STATEMENT OF HON. DIANA DEGETTE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO**

Ms. DEGETTE. Thank you very much, Mr. Chairman.

I really want to thank you for having this hearing today on LightSquared and expanding access to broadband, which we all agree is a key driver of economic growth for our Nation.

This administration has taken unprecedented steps to accelerate deployment of wired and wireless broadband networks, and the FCC has been a key partner in that effort.

Mr. Chairman, as you said, the policy issues today are important, and LightSquared and the GPS dispute deserve our scrutiny. Several other House committees have already looked at this issue over the last 2 years, and so, as the committee with primary jurisdiction, I wish we had looked at it sooner, but I am glad we are going to hear from the FCC witnesses today. These are experts who are widely respected for their knowledge and expertise, and I know we can learn a lot from them.

Mr. Chairman, in a lot of ways, the FCC was put in a no-win position. This was a difficult decision for them, and no matter what the agency did, someone was going to end up being very unhappy. And I don't know about you, but I certainly don't have the technical expertise and detailed knowledge to be in a position to second guess the FCC's decisions in this, but I do think we can look carefully at the FCC's decision-making process.

And I think the committee's investigation has revealed a regulatory review process working as it should. LightSquared was licensed to use spectrum to provide communication service. Over the years, LightSquared sought approval from the FCC to move ahead with its plans, and at every step of the way, the FCC solicited and received public comment on the committee's proposals.

Under both the Bush and Obama administrations, LightSquared received approvals from the FCC to create and modify its business plans to build a network.

During the approval process, public safety concerns with GPS receivers were brought to the FCC's attention. The FCC warned LightSquared of these concerns and only gave a conditional approval to the company to move ahead. Then they set up a process to let technical experts determine if these concerns were meritorious. The FCC made the decision to retract LightSquared's waiver only after the experts found that "there is no practical way to mitigate the potential interference." The FCC took the responsible steps that one would expect in order to address this problem.

FCC clearly told LightSquared that it would have to solve interference problems before it was allowed to move forward with its plan. FCC set up a technical working group to explore problems and made sure that all stakeholders were represented. When experts concluded that there were continued risks from deployment of the LightSquared network, the FCC took preventative action to ensure public safety.

As of today, LightSquared has offered alternatives to move ahead, and I hope they work, by the way. And the FCC remains open to exploring viable solutions.

Now, Mr. Chairman, it is not Congress' role to make these kinds of detailed technical decisions. I don't have the expertise to do so, and nobody else on the committee does. That is why Congress gave the authority to the FCC in the first place.

I would be concerned, of course, if the FCC made a politically-motivated decision or was swayed by political process, but I don't think anybody here thinks that that was the case in this situation. Instead, we have the FCC weighing the pros and cons and making a very difficult decision based on the advice of the technical experts.

I appreciate our witnesses being here, Mr. Chairman.

And I want to take just one minute of personal privilege. This might be the last hearing that we have in this Congress in the Oversight and Investigations Subcommittee, and I just want to say on a personal note how much I have enjoyed serving as ranking member with you, Mr. Chairman. We haven't always had calm and sedate hearings in this subcommittee, but we have always had respectful discourse, and we have always had debates and investigations that have attempted to shed the light on things.

And I have said, probably you have heard me say every single hearing we have had, I have been on this subcommittee for 16 years, and I have enjoyed serving with all of my chairmen. This chairman is no exception. I know I can speak for the entire side of my aisle in wishing you God speed and all success in whatever you decide to do in the future, Mr. Chairman.

And I yield back.

[The prepared statement of Ms. DeGette follows:]

**Opening Statement of Rep. Diana DeGette**
**Ranking Member, Subcommittee on Oversight and Investigations**
**Hearing on "The LightSquared Network: An Investigation of the FCC's Role"**
**Subcommittee on Oversight and Investigations**
**September 21, 2012**

Thank you Mr. Chairman. We're here today to examine the FCC's role with respect to LightSquared. I believe it is imperative that we expand access to broadband, which is a key driver of economic growth for our nation. This Administration has taken unprecedented steps to accelerate deployment of wired and wireless broadband networks, and the FCC has been a key partner in that effort.

Mr. Chairman, the policy issues here are important – and the LightSquared and GPS dispute deserve our scrutiny. Several other House committees have already looked at this issue over the past two years. As the Committee with primary jurisdiction, I wish we had turned to this matter sooner. Still, I'm glad that we will get a chance to examine the issue and hear from the FCC witnesses today - experts that are widely respected for their knowledge and expertise. I hope we approach this hearing in a constructive, fact-based manner.

Mr. Chairman, in a lot of ways, FCC was put in a no-win position. This was a difficult decision, and no matter what the agency did, someone was going to end up being very unhappy. And we as Congress lack the technical expertise and detailed knowledge to be in position to second-guess the FCC. But we can look carefully and learn from FCC's decisionmaking process.

And I think the Committee's investigation has revealed a regulatory review process working as it should. LightSquared was licensed to use spectrum to provide communications service. Over the years, LightSquared sought approval from the FCC to move ahead with its plans. At every step of the way, the FCC solicited and received public comment on the company's proposals. Under both the Bush and Obama Administrations, LightSquared received approvals from the FCC to create and modify its business plans to build a network.

During the approval process, public safety concerns with GPS receivers were brought to FCC's attention. The FCC warned LightSquared of these concerns and only gave a **conditional** approval to the company to move ahead. Then they set up a process to let technical experts examine if these concerns were meritorious. The FCC made the decision to retract LightSquared's waiver only after the experts found that, quote, "there is no practical way to mitigate the potential interference."

The FCC took the responsible steps that one would expect in order to address this problem. The agency conditioned its approval after GPS interference problems were raised. There was no uncertainty here: FCC clearly told LightSquared that it would have to solve interference problems before it was allowed to move forward with its plan. FCC set up a technical working group to explore problems, and made sure that all stakeholders were represented. When experts concluded that there were continued risks from deployment of the LightSquared network, the FCC took preventive action to ensure public safety. As of today, LightSquared has offered alternatives to move ahead, and the FCC remains open to exploring viable solutions.

Mr. Chairman, it's not Congress's role to make these kinds of detailed, technical decisions. I don't have the expertise to do so, and neither do any of us on the Committee. That's why we gave the authority to the FCC in the first place. Of course I would be concerned if there was evidence that the FCC made a politically motivated decision or was swayed by political pressure. But this Committee has uncovered no evidence that that is the case. Instead, we have FCC weighing all the pros and cons, and making a difficult decision based on the advice of the technical experts.

Mr. Chairman, I appreciate our FCC witnesses, Ms. DeLaTorre, and Mr. Knapp, appearing before us today, and I look forward to their testimony on FCC's LightSquared decisions.

Mr. STEARNS. Well, I thank my colleague. And she and I both know how much we have enjoyed our friendship here. And it is beyond just the hearing. And we have talked to each other on the floor many times, and we were friends even before I was chairman of this committee.

So I appreciate your salute and felicitations, and I appreciate our friendship after I am gone, too.

With that, let's recognize the two witnesses here. We have Ms. De La Torre, who serves as Chief of the International Bureau at the Federal Communications Commission. She previously served as Deputy Chief of the Telecommunication Division of the International Bureau. She was president of Telecommunication Management Company in Washington, DC. And she has a B.A. from Vanderbilt and a doctor's from the University of Texas.

We have Mr. Julius Knapp. He is Chief of the FCC's Office of Engineering and Technology. He became Chief in 2006, having previously served as Deputy Chief since 2002. He has a bachelor's degree in electrical engineering from the City College of New York.

**STATEMENTS OF JULIUS P. KNAPP, CHIEF, OFFICE OF ENGINEERING AND TECHNOLOGY, FEDERAL COMMUNICATIONS COMMISSION, AND MINDEL DE LA TORRE, CHIEF, INTERNATIONAL BUREAU, FEDERAL COMMUNICATIONS COMMISSION**

Mr. STEARNS. At this point, let me swear each of you in here. As you know, the testimony you are about to give is subject to Title 18, Section 1001, of the United States Code. While holding a hearing—when holding an investigative hearing, this committee has the practice of taking testimony under oath.

Do you have any objection to testifying under oath?

The Chair then advises you that, under the Rules of the House and the rules of the committee, you are entitled to be advised by counsel.

Do you desire to be advised by counsel at this time?

In that case, would you please rise and raise your right hand, and I will swear you in.

[Witnesses sworn.]

Mr. STEARNS. We now welcome your opening 5-minute testimony. Start with you, Ms. De La Torre. OK. Mr. Knapp, go ahead.

**STATEMENT OF JULIUS P. KNAPP**

Mr. KNAPP. Good morning Chairman Stearns, Ranking Member DeGette and members of the Oversight and Investigations Subcommittee. My name is Julius Knapp and I am the Chief of the Federal Communications Commission's Office of Engineering and Technology where I have served for 38 years. OET is the commission's primary——

Mr. STEARNS. Would you just pull the mic a little closer?

Mr. KNAPP. OET is the commission's primary resource for engineering expertise and provides technical support to the chairman, commissioners and the FCC's bureaus and offices. I appreciate this opportunity to join my colleague, Mindel De La Torre, chief of the International Bureau in appearing before you today. My portion of the testimony will focus on the FCC's role in evaluating and at-

tempting to resolve spectrum interference issues in connection with the mobile satellite service in the L-band.

Ms. De La Torre will address the process in historical context relating to granting Ancillary Terrestrial Component, or ATC, authority to mobile satellite or MSS providers. At the commission, we are focused on ensuring that businesses and consumers are able to take full advantage of the economic opportunity presented by underutilized spectrum but only when consistent with public health and safety. In its decade-long proceeding to remove regulatory barriers and align the service rules for the L-band with the rapid evolution of mobile communications technologies and markets, the commission considered a unique proposal that had the prospect of attracting new investment, increasing competition, bringing additional broadband service to rural and hard-to-reach regions and creating thousands of jobs.

This proposal was the direct result of proceedings designed to ensure that MSS spectrum would be utilized to its full potential. As with any proceeding before the commission that has a potential for spectrum interference with nearby spectrum users, the FCC relies on licensees and stakeholders to raise any relevant interference concerns. During the decade preceding the LightSquared November 2010 waiver request, the GPS industry had numerous opportunities to inform the commission of the receiver overload issue. Despite participating extensively throughout these proceedings and raising other interference issues that were ultimately resolved, it did not do so.

The FCC would have investigated any potential interference issues as soon as they were raised and attempted to resolve them. Nevertheless, once GPS receiver manufacturers and service providers ultimately informed the commission of the potential for interference to legacy devices, the commission halted the licensees' proposed commercial service.

To be clear, in November 2010, the GPS industry was not complaining about signals from LightSquared signals falling into the GPS band; they were instead notifying us that GPS receivers would pick up signals far into the neighboring band. In responding to those GPS concerns, the commission acted responsibly under its 70-year memorandum of understanding with the Department of Commerce to protect national security and public safety, while simultaneously attempting to find a solution to the GPS receiver overload issue. The commission's goals and proceedings such as these are to foster cooperative engineering solutions to what sometimes seemed to be impossible problems. We worked equally with all of the interested entities, including NTIA, the Department of Defense, other Federal agencies and the GPS Industry Council to assess LightSquared's proposal and to encourage the parties to work together to resolve this matter. This process has been fact-based, transparent and in accordance with the commission's established policies and procedures.

Now, as I have mentioned in this instance the interference is caused by GPS receivers picking up signals outside of the GPS band. The commission relies on receiver manufacturers and service providers to report potential interference issues because they are in the best position to understand the parameters and limitations of

their own equipment. The commission does not possess the technical specifications for the hundreds of different types of GPS devices utilized by commercial users, government contractors and government entities.

Moreover, since the FCC does not regulate GPS devices we are not prepared to test such devices or determine their capabilities and interference issues. Manufacturers and service providers have the relevant information, and they also have the incentive to notify the commission of the potential for receiver overload, so as to avoid problems with their services and products. The lack of technical data provided in response to earlier commission proceedings prevented us from addressing that issue until well after permission had been granted in 2003 for MSS providers to use the L-band for terrestrial service.

Again, thank you for this opportunity to appear before you and I look forward to your questions.

Mr. STEARNS. Thank you.

Ms. De La Torre.

**STATEMENT OF MINDEL DE LA TORRE**

Ms. DE LA TORRE. Good morning, Chairman Stearns and Ranking Member DeGette and members of the Oversight——

Mr. STEARNS. You might have to pull the mic just a little closer, too, if you don't mind.

Ms. DE LA TORRE. Good morning.

My name is Mindel De La Torre, as we have said, and I am Chief of the International Bureau at the FCC. I am pleased to have this opportunity to follow my esteemed colleague Julius Knapp in providing you the background and context related to the FCC's process in the MSS ATC L-band matter.

I have been Chief of the International Bureau since October 2009, where I oversee the Bureau's functions with regard to licensing of international and domestic satellites, international long distance, international broadcast stations and submarine cables, as well as the FCC's participation in bilateral and multilateral efforts.

I previously worked at both the NTIA and the FCC, and I appreciate the two distinct roles that these agencies play in ensuring adequate spectrum for America's consumers and governmental entities. As my colleague mentioned, the commission is focused on lifting regulatory barriers and ensuring economic growth.

The MSS ATC L-band proposal, filed with the International Bureau in March 2009, represented such an opportunity. However, when we were informed that there was a potential for receiver overload interference from the GPS community, we took action to ensure that these essential U.S. services, government services as well as commercial activities, would not be disrupted. The detailed summary in my written statement and the attached appendix outline the commission's 10-year history in the MSS proceeding.

The commission has consistently, across the tenures of three chairmen, worked to promote terrestrial use of MSS spectrum. This history further shows that the commission acted in accordance with established procedures and allowed multiple opportunities for public participation. Also, the commission staff exercised delegated authority only where consistent with commission rules and provided

at least 48 hours advanced notice to individual commissioners to inquire about these decisions.

The proceedings relevant to this hearing began in 2001, when LightSquared's predecessor in interest, Mobile Satellite Ventures, MSV, along with ICO Global, petitioned the commission to allow for the addition of an ancillary terrestrial component, ATC, to integrate terrestrial services with their mobile satellite services. These parties argued to the public that the public would benefit from the terrestrial component because it would enhance coverage in areas where reliable satellite service was challenging. In 2003, the commission approved rules to permit MSS licensees to operate up to 1,725 base stations, and in 2005, this limitation was lifted to provide mobile service to areas where satellite signals are degraded or blocked, specifically urban areas and inside of buildings.

The U.S. GPS Industry Council filed the petition for reconsideration of the out-of-band emission rules noting, that the rules failed to adopt emission limits specified in the 2002 agreement. USGIC noted that the limits were necessary to protect against potential deployment of tens of thousands of cell towers and millions of mobile devices. The receiver overload issue, however, was not raised in this proceeding.

Over the course of the next 8 years, the commission engaged in several actions designed to foster MSS ATC deployment. The record shows that the GPS industry consistently failed through several proceedings to specifically notify the FCC of receiver overload problems or concerns until briefly referencing the issue in comments related to the July 2010 MSS Notice of Proposed Rulemaking and Notice of Inquiry and then again in response to the November 2010 waiver request.

In the interim, the commission provided MSS ATC authority, set power limits and other operating parameters, as well as acted on the transfer applications ultimately leading to LightSquared's status as a licensee. On January 26, 2011, the International Bureau responded to the concerns raised by the GPS industry and other parties by preventing LightSquared from deploying commercial service in the L-band until it resolved concerns about harmful interference. The Bureau did so through a conditional waiver order that also directed LightSquared to organize and participate in a GPS Interference Technical Working Group, in which all interested parties worked directly with LightSquared to resolve the interference concerns. The Technical Working Group included more than 120 participants, including representatives from the Department of Defense and other Federal agencies, as well as the GPS community and various telecommunications companies and, of course, LightSquared itself.

On June 30, 2011, LightSquared filed a final report of the Technical Working Group with the commission. And based on these results, LightSquared recognized that in its proposed use of part of its spectrum, what we call the upper 10 megahertz band, would result in GPS receiver overload. LightSquared offered an alternative proposal to operate only in the lower 10 megahertz band and to coordinate and share the cost of underwriting a workable solution for GPS legacy precision measurement devices that were at risk of overload.

The FCC released a Technical Working Group's report as well as LightSquared's alternative proposal for public comment in June 2011 and subsequently required further testing. On February 14, 2012, the commission received a letter——

Mr. STEARNS. If you could just sum up.

Ms. DE LA TORRE. OK. And so the commission staff is currently reviewing the extensive record developed in response to the public notice. Currently, LightSquared still cannot deploy its service commercially because of the unresolved receiver overload interference issue. And this concludes my testimony.

[The prepared statement of Mr. Knapp and Ms. De La Torre follows:]

**Joint Written Statement of**

**Julius P. Knapp**

**Chief, Office of Engineering and Technology**

**Mindel De La Torre**

**Chief, International Bureau**

**Federal Communications Commission**

**Before the House Oversight and Investigations Subcommittee**

**Energy and Commerce Committee**

**U.S. House of Representatives**

**"The LightSquared Network: An Investigation of the FCC's Role"**

**September 21, 2012**

Good morning Chairman Stearns, Ranking Member DeGette, and Members of the Oversight and Investigations Subcommittee.

My name is Julius Knapp, and I am Chief of the Federal Communications Commission's Office of Engineering and Technology (OET), where I have served as an engineer for 38 years. OET is the Commission's primary resource for engineering expertise and provides technical support to the Chairman, Commissioners, and the FCC's Bureaus and Offices.

I appreciate this opportunity to join my colleague, Mindel De La Torre, Chief of the FCC's International Bureau, in appearing before you today. My portion of the testimony will focus on the FCC's role in evaluating and attempting to resolve spectrum interference issues in connection with Mobile Satellite Service (MSS) in the L-band. Ms.

De La Torre will address the process and historical context related to granting Ancillary Terrestrial Component (ATC) authority to MSS providers.

At the Commission, we are focused on ensuring that businesses and consumers are able to take full advantage of the economic opportunities presented by underutilized spectrum, but only when consistent with public health and safety. In this decade-long proceeding to remove regulatory barriers and align the service rules for the L-band with the rapid evolution of mobile communications technologies and markets, the Commission considered a unique proposal that had the prospect of attracting new private investment, increasing competition, bringing additional broadband service to rural and hard-to-reach regions, and creating thousands of jobs. This proposal was the direct result of proceedings designed to ensure that MSS spectrum would be utilized to its maximum potential.

As with any proceeding before the Commission that has a potential for spectrum interference with nearby spectrum users, the FCC relies on licensees and stakeholders to raise interference concerns to ensure the timely resolution of such complaints. During the decade preceding the November 2010 waiver request, the GPS industry had numerous opportunities – detailed below – to inform the Commission of the receiver overload interference issue ultimately raised in 2010.

Despite participating in multiple proceedings, and raising *other* interference issues that were ultimately resolved to the GPS industry's satisfaction, it did not do so. The FCC would have investigated any complaints as soon as they were raised and attempted to mitigate at that stage. Nevertheless, when GPS receiver manufacturers and service providers ultimately informed the Commission of the potential for legacy device overload

interference in the L-band, the Commission halted the licensee's proposed commercial service. To be clear, in November 2010, the GPS industry was not complaining about out of band emissions or interference caused by handsets, or the power levels authorized for the L-band – they were instead notifying us of their own receivers potentially picking up signals from the neighboring band.

In responding to those GPS concerns, the Commission acted responsibly to protect national security and public safety while simultaneously attempting to find a solution to the GPS overload interference issue. We worked equally with all interested entities, including the NTIA, DOD, other federal agencies, and the United States GPS Industry Council (USGIC) to assess LightSquared's proposal and to encourage the parties to work together to resolve this matter. The process was fact-based, transparent, and in accordance with the Commission's established policies and procedures. I stand behind the work of our engineers and other technical experts.

**Spectrum Management Responsibilities and GPS Issues**

Spectrum is of vital importance to our economy. It is, however, a finite and increasingly scarce resource. Accordingly, the Commission has focused its efforts on ensuring that this resource is used to the greatest degree possible to spur competition, increase investment and innovation, and create jobs. At the same time, we are dedicated to the protection of homeland security and national defense, and we recognize the needs of existing licensees to utilize spectrum for a broad range of commercial and noncommercial purposes.

The FCC and the NTIA share responsibility for managing the radio spectrum. The FCC is responsible for use of the spectrum by the commercial sector and state and local governments. The NTIA is responsible for federal government use. These shared responsibilities require that the FCC and the NTIA coordinate on such matters as the prevention and resolution of harmful interference issues. Under a 70-year old Memorandum of Understanding with the Department of Commerce, the FCC and the NTIA coordinate activities on spectrum matters of mutual interest.

The need to ensure proper coordination of spectrum resources is well known to this Committee. Last week, for instance, the Communications and Technology Subcommittee held a hearing on "Creating Opportunities through Improved Government Spectrum Efficiency." As the Subcommittee's hearing memorandum noted, "[u]sing spectrum more efficiently and with modernized equipment could help Federal agencies better fulfill their objectives while freeing spectrum for broadband services." Those goals – particularly increasing spectrum efficiency and freeing spectrum for broadband services while enabling Federal agencies to fulfill their objectives – have driven the Commission's efforts to reduce regulatory barriers for use of the L-band spectrum.

The GPS-MSS conflict involves unfiltered or poorly filtered GPS legacy devices bleeding into the spectrum of neighboring users, with the result being receiver overload. Thus, the interference at issue today does *not* result from MSS/ATC L-band users emitting signals into the GPS spectrum. Rather, it results from legacy GPS devices listening into the band next door to them. In effect, we discovered that some GPS legacy equipment effectively treats the GPS spectrum and the L-band spectrum as one band.

When faced with conflicting uses and interference complaints such as these, the Commission's engineers and technical experts have always initiated fact-based, transparent reviews of interference complaints. The Commission's goal in proceedings such as these is to foster cooperative, engineering solutions to what sometimes seem to be impossible problems. This process is dependent upon the active participation of all stakeholders and the timely reporting of essential technical information to the Commission.

In particular, the Commission relies on receiver manufacturers and service providers to report interference issues because they are best positioned to understand the parameters and limitations of their own equipment. The Commission does not possess the technical specifications for the hundreds of types of GPS devices utilized by commercial users, government contractors, and government entities. Moreover, since the FCC does not regulate GPS devices, we are not prepared to test such devices or determine their capabilities and interference issues.

Manufacturers and service providers have the relevant information, and they also have the incentive to notify the Commission of the potential for receiver overload so as to avoid problems with their services and products. The Commission routinely hears from parties that are concerned that new services will cause interference. In this instance – unlike any other that I can recall in my decades at the FCC – the GPS industry did not do so until very late in the proceeding. Once the Commission received that information, it acted quickly to prevent any public safety problems. The lack of technical data provided in response to earlier Commission proceedings prevented us from addressing that issue

until well after permission had been granted in 2003 for MSS providers to use the L-band for terrestrial service.

**A Decade of Promoting Greater Use of MSS Spectrum***

A more detailed summary of the Commission's ten-year history of MSS proceedings demonstrates that the Commission consistently, across the tenures of three FCC Chairmen, worked to enable terrestrial use of MSS spectrum. This history further shows that the Commission acted in accordance with established procedures and allowed multiple opportunities for public participation. Also, the Commission staff exercised delegated authority only where consistent with Commission rules and provided at least 48 hours advance notice to individual Commissioners to inquire about these decisions.

The proceedings relevant to this hearing began in 2001, when LightSquared's predecessor-in-interest, Mobile Satellite Ventures (MSV), along with another company, ICO Global, petitioned the Commission to allow for the addition of an ancillary terrestrial component (ATC) to integrate terrestrial services with their mobile satellite services. These parties argued that the public would benefit from this terrestrial component because it would enhance coverage in locations where reliable satellite service was challenging, particularly urban areas.

Later in 2001, the Commission issued a Notice of Proposed Rulemaking seeking comment on MSV's petition and the appropriate technical rules for protecting GPS operations. The Notice specifically invited comment on the requirements necessary to protect GPS against harmful interference. In July 2002, MSV and the USGIC submitted

* Attached as "Appendix A" to this testimony is a timeline providing the complete procedural history of the MSS/ATC and LightSquared's proposal.

for the record of that proceeding, a joint agreement on emission limits into the GPS spectrum and stated that this agreement would adequately protect GPS receivers.

In 2003, the Commission approved rules to permit MSS licensees to operate up to 1,725 ATC base stations to provide mobile service to areas where satellite signals are degraded or blocked (specifically urban areas and inside of buildings). The USGIC filed a petition for reconsideration of the out-of-band emission rules, noting that the rules failed to adopt the emission limits specified in the 2002 agreement. USGIC noted that the limits were necessary to protect against the potential deployment of tens of thousands of cell towers and millions of mobile devices. Again, however, the receiver overload issue was *not* raised in opposition comments or in petitions for reconsideration or applications for review.

In 2003, SkyTerra (formerly MSV, now LightSquared) requested authority (*i.e.*, a license) to offer an MSS/ATC service. The International Bureau sought public input on this request. It again received no comments raising receiver overload interference.

In 2004, the International Bureau, on delegated authority, applied the Commission's 2003 Order on ATC authorizations to permit SkyTerra to offer an integrated MSS/ATC service to users equipped with dual-mode handsets. SkyTerra was authorized to deploy a terrestrial network using the 1,725 base stations permitted under the Commission's then-existing rules. Once again, no parties raised the overload interference issue in response to the grant of this authorization, and no parties filed a petition for reconsideration of the authorization.

In 2005, in response to petitions for reconsideration of its 2003 Order, including the one filed by USGIC, the Commission revised its MSS/ATC rules. The new rules

removed the limitation on the number of terrestrial base stations (1,725) so long as operations met certain technical parameters. The Commission also noted that MSV agreed to comply with the tighter limits on out-of-band emissions in a manner consistent with the recommendations of the USGIC and the Executive Branch (including the Department of Defense). The Commission also affirmed its commitment in the Order to coordinate any ATC authority with NTIA to assure adequate protection of the GPS. The Commission received no reports or complaints of potential overload interference following the release of this order – which had explicitly lifted the base station limit.

Between 2006 and 2008, the International Bureau granted modifications to SkyTerra MSS operations, but none of the modifications implicated its authority to deploy an unlimited number of terrestrial base stations under its ATC authority.

In 2009, Harbinger and SkyTerra filed an application for transfer of control of SkyTerra to Harbinger. SkyTerra also filed an application for modification of its MSS/ATC authorization including a request for waiver of several technical rules. The International Bureau placed both filings out for public comment. The GPS community, including USGIC, filed comments raising concerns that the existing out-of-band emission limits would be insufficient to protect indoor reception of GPS from mobile devices due to emissions from mobile devices communicating with the base stations. Once again, no party raised the separate receiver overload interference issue.

Later in 2009, SkyTerra and the USGIC submitted a joint letter to the Commission stating that the out-of-band emissions interference issue had been resolved. The joint letter did not raise the different receiver overload interference issue.

In 2010, the Commission released its National Broadband Plan. The Plan, in Recommendation 5.8.4, identified the 40 MHz of L-band spectrum (then licensed to SkyTerra) in its call for the FCC to accelerate terrestrial deployment in the MSS spectrum bands. No entity raised the receiver overload interference issue in response to this recommendation.

In March 2010, the three Commission Bureaus (the Office of Engineering and Technology, the International Bureau, and the Wireless Telecommunications Bureau) jointly issued two orders. The first of those orders granted Harbinger's request to acquire SkyTerra. That Order detailed Harbinger's plans to construct a hybrid-satellite-terrestrial network and noted Harbinger's intention to cover 90 percent of the U.S. population via the terrestrial component of its network. That Order imposed conditions on Harbinger that required it to build out this network but did not alter or waive any MSS/ATC rules. In the second Order, the International Bureau granted Harbinger's request for a modification of its MSS/ATC authorization. Again, no parties or entities raised the receiver overload interference issue in response to either of these Orders.

In July 2010, the Commission initiated a rulemaking to provide greater flexibility to deploy terrestrial service in the MSS bands, including the L-band. In September 2010, *for the first time*, the USGIC filed comments raising the possibility of receiver overload interference to GPS receivers at a distance of about 100 meters from ATC base stations. This interference would be greater for devices that did not use state-of-the-art filtering such as certain mobile consumer GPS devices. In its comments, the USGIC noted that it had worked collaboratively with the MSS/ATC operators in the past and had reached mutually acceptable agreements to avoid interference into the GPS band. USGIC also

expressed a belief that solutions would be available to mitigate the receiver overload interference issue.

In November 2010, LightSquared filed a request to modify its MSS/ATC authority further to allow sales of mobile devices that had terrestrial-only capabilities as part of an integrated MSS/ATC service. The International Bureau placed this request on public notice, and ultimately extended the comment period in response to a request for additional time. Several GPS industry participants and users objected to LightSquared's planned MSS/ATC deployment based upon the receiver overload interference issue.

On January 26, 2011, the International Bureau responded to the concerns raised by the GPS industry and other parties by preventing LightSquared from deploying commercial service in the L-band until it resolved concerns about harmful interference. The Bureau did so through a conditional waiver order that also directed LightSquared to organize and participate in a GPS interference technical working group in which all interested parties would work directly with LightSquared to resolve the interference concerns. The Technical Working Group included more than 120 participants, including representatives from the Department of Defense and other federal agencies, as well as the GPS community, various telecommunications companies, and LightSquared.

On June 30, 2011, LightSquared filed the final report of the Technical Working Group with the Commission. Based on the results of the working group's testing, LightSquared recognized that its proposed use of part of its spectrum (the "upper 10 MHz band") would result in GPS receiver overload. LightSquared offered an alternative proposal to operate only in another part of its spectrum ("the lower 10 MHz band") and to

coordinate and share the cost of underwriting a workable solution for GPS legacy precision measurement devices at risk of overload.

The FCC released the Technical Working Group's report and the alternative proposal for public comment in June 2011. After reviewing more than 3,000 comments concerning the report, in September 2011, the International Bureau and the Office of Engineering and Technology, in coordination with NTIA, released a Public Notice calling for additional testing to assess the potential for interference to GPS under the revised technical proposals.

On February 14, 2012, after that further testing, the Commission received a letter from NTIA stating that the results of the testing indicated no current, practical way to mitigate the GPS receiver overload interference issue for legacy equipment. The next day, the Commission's International Bureau issued a Public Notice seeking public comment on whether it should (1) vacate the Conditional Waiver Order, and (2) suspend indefinitely LightSquared's ATC authority to an extent consistent with the NTIA letter. The Commission staff is currently reviewing the extensive record developed in response to that Public Notice. At the current time, LightSquared cannot deploy its service commercially because of the unresolved receiver overload interference issue.

## Conclusion

As we stated at the outset, at the Commission we are focused on ensuring that businesses and consumers are able to take full advantage of the economic opportunities presented by underutilized spectrum, but only when consistent with public health and safety. We are also cognizant of the underlying issue in this case concerning legacy GPS receivers and receiver standards. Accordingly, the Commission moved ahead this earlier this year to

conduct a receiver performance workshop and we expect forthcoming information. The FCC's Technological Advisory Council (TAC) is reviewing this issue and we expect a report to the Commission on this subject in the next few weeks.

This concludes our testimony and we look forward to answering your questions.

Mr. STEARNS. Thank you.

And I will start with my questions.

And Ms. De La Torre, I am going to ask you a question. If possible, you could just answer yes or no. In an August 4, 2011, email, marked as Exhibit 1 in your binder, you made an analogy that a LightSquared GPS situation determining interference, the interference dispute on the highway, where LightSquared is operating—and this is what you indicated—is operating in the left lane and GPS is operating in the middle lane; you state that GPS "has been driving in the left lane with impunity, but now that it looks like the left lane might actually have traffic in it, the GPS community is yelling bloody murder." Is that true? Is that what you wrote?

Ms. DE LA TORRE. I did write that.

Mr. STEARNS. Each operator has responsibility to stay in its lane, using your analogy. Is that correct?

Ms. DE LA TORRE. Yes.

Mr. STEARNS. And when one operator veers into the adjacent lane, is it the responsibility of that operator to correct its course, or is it the role of the FCC to patrol the highway, briefly?

Ms. DE LA TORRE. Really what was happening here was that——

Mr. STEARNS. Isn't the responsibility of the operator to correct its course, yes or no?

Ms. DE LA TORRE. That is a difficult question. That is the question that is before us.

Mr. STEARNS. Yes or no.

Ms. DEGETTE. Can't you let her answer it?

Mr. STEARNS. No. I am asking for a yes or no. Do the best of your ability?

Ms. DE LA TORRE. Well, I think that they do have a duty to respond.

Mr. STEARNS. OK. I am going to take that as a yes.

Does GPS companies have a duty to design receivers that filter out signals in adjacent bands, yes or no?

Ms. DE LA TORRE. I will let Mr. Knapp, who is the engineer, answer that question.

Mr. STEARNS. Well, you can answer, too. Based upon your email, I would say your answer would be yes; they have a duty to design receivers that filter out signals in adjacent bands, is that correct? Say yes.

Ms. DE LA TORRE. Yes.

Mr. STEARNS. OK.

Mr. Knapp, I am ready for you now. You state in your testimony, some GPS legacy equipment effectively treats the GPS spectrum and the L-band spectrum as one band, is that true?

Mr. KNAPP. That is true.

Mr. STEARNS. Since the problem appears to be GPS devices and not LightSquared's emission, what does this mean for the future of the L-band?

Mr. KNAPP. So the difficult issue we have is all of the millions of legacy devices that are out there relied on for things like public safety and so forth, and there is no easy way to fix many of them. So we absolutely do need to be thinking about what we do going forward, and we are doing just that.

Mr. STEARNS. If GPS does not make changes to its wide front-end receiver devices, do you envision a scenario where anyone can operate in the L-band in the future?

Mr. KNAPP. I think what we are trying to do——

Mr. STEARNS. If they do nothing is the L-band available?

Mr. KNAPP. Well, for the high power equipment that has been proposed, the issue of the upper 10 is problematic; the lower 10, I think, is still subject to our open proceeding.

Mr. STEARNS. But wouldn't you say, based upon what I just said, that this L-band is going to be in jeopardy if there is not some type of effort by GPS to make changes to its front-end receiver? Isn't that true?

Mr. KNAPP. What we need to do——

Mr. STEARNS. Yes or no.

Mr. KNAPP. It would be yes.

Mr. STEARNS. OK, yes.

Ms. De La Torre, one day after receiving LightSquared's updated business plan and request for a waiver of the integrated services rule on November 18, 2010, the FCC placed the request on public notice providing a 10-day period for initial comments. How many days does the FCC normally provide for comments after issuing a public notice for an ATC modification request?

Ms. DE LA TORRE. Anywhere from 7 to 21 days.

Mr. STEARNS. Was the expedited comment period relating to the FCC's March 2010 order requiring that LightSquared follow an aggressive build-out schedule for its network?

Ms. DE LA TORRE. Well, they had—the proceeding, as I mentioned, has been going on since 2001, so there was a lot of documents in the record, so we put it out for public notice.

Mr. STEARNS. Did anyone request an extension of the comment period, and if so, who and was the request granted?

Ms. DE LA TORRE. Yes, there was a request for extension, and we did grant that extension. We granted the extension for 3 days.

Mr. STEARNS. Did the parties requesting an extension have a chance to actually file their comments in the proceedings?

Ms. DE LA TORRE. Yes, they did.

Mr. STEARNS. There are many concerns I have with the process, but the greatest concern that I have is that your agency, acting only on one day after the NTIA sent their comments to the FCC, rushed through a public notice that would put LightSquared in regulatory limbo with no alternative in sight. Can you explain to me why the FCC did not first look to alternatives, short of proposing to suspend the company's licenses?

Ms. DE LA TORRE. What we wanted to do is we wanted to get public comment as much as we possibly could on this important report that we had gotten from NTIA and the letter from NTIA. We wanted to get as much comment as we possibly could, so we put it out as soon as we could.

Mr. STEARNS. But acting only one day after NTIA sent their commitment to the FCC, it seems like you rushed it.

Ms. DE LA TORRE. I don't know that we rushed it, but we were definitely—we wanted to get as much information as we possibly could.

Mr. STEARNS. I am anxious for the FCC to reach a conclusion on this matter and continue to hope a solution can be found. When do you plan to wrap up your review of your February public notice?

Mr. KNAPP. So we don't have a specific target. It is a complex issue and LightSquared has put some new ideas on the table, and we think everything is worth considering at this point.

Mr. STEARNS. All right. My time is expired.

Ms. DEGETTE. Thank you very much, Mr. Chairman.

Ms. De La Torre, I just want to clarify your answers to the previous questions. This memo, this August 4, 2011, memo, Exhibit 1, that the chairman was referring to, I think it would be fair to say that what happened here was that the spectrum was allocated in a certain way, so that the GPS had a certain portion of the spectrum, correct?

Ms. DE LA TORRE. Yes, that is correct.

Ms. DEGETTE. And LightSquared had been approved conditionally for portions of the spectrum that were adjacent to the GPS portions, correct?

Ms. DE LA TORRE. Yes. Dating back to 2004.

Ms. DEGETTE. Yes. And after the conditional approval, the GPS community came forward belatedly and told the FCC that they were concerned because they were actually going into portions of the spectrum that LightSquared had been conditionally approved to use, is that correct?

Ms. DE LA TORRE. There had been an order that had been—the transfer of control order from SkyTerra to Harbingerhad been issued the year before in March 2010. And with that order, there was another accompanying order that modified the license. And so that had happened earlier in the year.

Ms. DEGETTE. But you were frustrated when you wrote this memo because the GPS folks were supposed to stay, as you said, in their lane, but they consistently went over into the other lanes that had been conditionally authorized for others, right? Yes or no would work with this one.

Ms. DE LA TORRE. Yes.

Ms. DEGETTE. Thank you.

But you also recognized in this memo, and the part that the chairman didn't refer to, that the problem here is that GPS—and I want to ask you about this, too, Mr. Knapp, because there had been some glancing references to it—but this GPS wave length is very important, security wise, is that right?

Mr. KNAPP. Absolutely.

Ms. DEGETTE. So, Mr. Knapp, in your testimony, you said that there are concerns about national security and safety with GPS, is that right?

Mr. KNAPP. Of course.

Ms. DEGETTE. And Ms. De La Torre, at the end of your memo, you say, "this is a very complicated issue and tough choices will need to be made and may in fact change the established rules of the road, but how many times do we have to reiterate we will not endanger one person on an airplane, one soldier, one voter or one driver who relies on your GPS service." Is that what you said in the memo?

Ms. DE LA TORRE. Yes, I did.

Ms. DEGETTE. And that is because, even though it is irritating that maybe GPS is not staying in their lane, if you literally hold them to that and there is some problem with this GPS, then it could affect national security communications or transportation, like airplane communications, is that correct?

Ms. DE LA TORRE. Yes.

Ms. DEGETTE. Mr. Knapp.

Mr. KNAPP. Yes.

Ms. DEGETTE. OK. So I can see why you would be frustrated, because poor LightSquared, you know, they got this conditional approval, and through no fault of their own, the GPS is going over into their lane. And I think that is why your review process is still open, because you are still trying to find a solution to it; is that correct Ms. De La Torre?

Ms. DE LA TORRE. Yes, absolutely.

Ms. DEGETTE. And so here is my question: I know that LightSquared has come forward with some other proposals to use different parts of the spectrum and so on. Are you considering those other proposals right now?

Ms. DE LA TORRE. Yes. As Mr. Knapp said, yes, we are currently considering them.

Ms. DEGETTE. Mr. Knapp.

Mr. KNAPP. If I may, I should add that several of those proposals include spectrum that is used by the Federal Government, so the Federal side, NTIA, would have the lead in determining whether those are viable.

Ms. DEGETTE. In order to make that determination, do you need congressional action?

Mr. KNAPP. No. At this juncture, I can't project whether that would be necessary or not, but certainly we would come back if that seemed to make sense.

Ms. DEGETTE. OK. So it is not like, and either one of you can answer this, it is not really like the FCC is trying to arbitrarily sabotage this investment that LightSquared has made, which is substantial, correct?

Mr. KNAPP. Absolutely not.

Ms. DEGETTE. And in fact, you are still trying to find a solution, is that right?

Mr. KNAPP. That is right.

Ms. DEGETTE. OK. I don't have any more questions.

Thank you, Mr. Chairman. I yield back.

Mr. STEARNS. You have got one second left. Do you want to ask him, is there a solution?

Ms. DEGETTE. You can ask him.

Mr. STEARNS. I will take your one second. Is there a solution?

Mr. KNAPP. There are ideas worth considering.

Mr. STEARNS. So the answer to the question is, yes, there is a solution.

Mr. KNAPP. Yes.

Mr. STEARNS. OK. Thank you.

With that, I recognize Dr. Burgess for 5 minutes.

Mr. BURGESS. Thank you, Mr. Chairman.

Now, Mr. Knapp, you said "worth considering" twice, so it is intriguing. This is an enormously complex issue made even more

complex. By now I have got mental images of double wides and winding mountain roads. But I think that is really what the committee is asking is about a solution and a solution where both parties can actually come away with something, neither party is harmed to the extent that they can be kept from harm, and we don't tread upon the rights of other people who have reasonable uses for spectrum that already exists; is that a fair statement?

Mr. KNAPP. That is a fair statement.

Mr. BURGESS. Well, then, in the things that you have——

Mr. STEARNS. Dr. Burgess, can you just pull your mic up a little bit, just so it is easy to hear you. We are waiting on every word you say, so we have got to hear it.

Mr. BURGESS. Well, in that context of having things that are worth considering, surely you have some solutions that you have been pushing back and forth between yourselves at the FCC. Is there any of those that you are willing to share with the committee this morning?

Mr. KNAPP. Not specifically. I will say that it is not only this immediate issue, but we also think long term about the implications for use of the spectrum because of the spectrum crunch and the importance of getting every ounce of benefit out of all of the spectrum that we possibly can.

Mr. BURGESS. And we certainly bump up against this from time to time in this committee because of the fact that the spectrum is a valuable asset owned by the People of the United States. The government is in a cash crunch, so sometimes, we actually go to spectrum as a solution.

Let me just ask a couple process questions of both of you, and I referenced this in my opening statement, the comment period before the issuance of the conditional waiver. It does seem to be condensed, especially when you are dealing with an issue of this complexity. Is that a fair observation for me to make? And bear in mind I am just a simply country doctor; I am not an engineer. So it seems like you drop it before Thanksgiving or between Thanksgiving and Christmas. It looks like Harry Reid's health care bill to me. That is not a time where a lot of people are paying attention.

Mr. KNAPP. If you view this in the broader context of the long history of the proceeding, we had a commission rulemaking proceeding that set out the policies that were to apply here. What the staff was doing was just implementing those policies. There already was provisions for a substantial terrestrial network. And if you look at what action was actually taken, we took the very tough step of saying that the system could not be operated commercially until this issue was resolved. And we put in place a process to understand the scope of the problem and try to find a way to get solutions to it. So although the specific timeframe of the action may have appeared in isolation as short, what we were doing was moving as quickly as we could through the process to find an answer.

Mr. BURGESS. And yet some of the principals involved, the GPS industry, the Air Force, did seem to feel that there was inadequate time, did they not? Did they not express that to you?

Mr. KNAPP. So what we did in the action, they had asked that we needed time for further tests, so the process we put in place did just that. And we made sure that those parties were all engaged,

and they were engaged heavily in the process of conducting the tests and examining solutions.

Mr. BURGESS. But then there was an extension granted, is that correct?

Mr. KNAPP. There was an extension of time for the comments.

Mr. BURGESS. For the comments.

Mr. KNAPP. Yes, absolutely. And it was all considered, and it resulted in the action that the agency took.

Mr. BURGESS. And refresh my memory, how long was the extension of the comment period?

Ms. DE LA TORRE. It was 3 days.

Mr. BURGESS. Again, I am just a simple outside observer. For an issue of this complexity, did the parties who complained about the length of the comment period, were they mollified by a 3-day extension.

Ms. DE LA TORRE. Well, they did in fact file comments in the proceeding, and they came in and they had various meetings with us during that time. So there was plenty of time for them to meet and to give us their views on the proceeding.

Mr. BURGESS. Well, just as an outside observer across the street, 3 days doesn't seem like a lot of time for an issue of this complexity. I appreciate the fact it had been worked on for a long time and a lot of people had much more working knowledge on this than I do, but it does seem condensed. What did they relate to you when you said, OK, you got 3 more days? Did they say, this is great, that is all we needed?

Ms. DE LA TORRE. Well, what I recall is that they in fact did file within that period. And then they had plenty of time to come in before the waiver order was issued in January. So they had many weeks to come in. They took advantage of that time. We heard their concerns. In fact, as Mr. Knapp said, the action that we took, took direct consideration of what they had raised with us. And we basically stopped LightSquared from going forward with commercial deployment of its system until the interference concerns were resolved. Now, we did not resolve those.

Mr. BURGESS. Can I stop you here for a second? I know my time is up. But it seems like the interference questions haven't been resolved even at this stage. Am I understanding that correctly?

Ms. DE LA TORRE. You are. And that is one reason why getting the process started as soon as possible was really important. We wanted to get that started and get all the parties together.

Mr. BURGESS. Thank you, Mr. Chairman.

I appreciate the indulgence.

Mr. STEARNS. And the gentlelady from—oh, Mr. Bilbray was here.

I think Mr. Bilbray is next for 5 minutes.

Mr. BILBRAY. Thank you, Mr. Chairman.

Mr. Chairman, let me first clarify; I have got a personal stake in this. Any one of us that go off into the ocean with our families offshore know how important the GPS is, not just for aircraft, not just for finding our way around streets, but basically getting home and making sure you don't run into some rocks.

On the flip side, if I may say to the ranking member, just as much as the GPS is essential, there are thousands of people off-

shore every day that would have a huge safety factor if they could pull up their iPhone and from 200 miles offshore to be able to call for emergency services. So this has a safety issue going from both ways.

But I think this is a much bigger issue than just GPS or a new access into the LightSquared. And if I could say to the ranking member, we need to recognize that this is setting the message across the country and around the world of exactly how the Federal Government is going to handle the situation. And if we do not straighten this out, the alternative is for us to have an intransigent locked-in system that says, nope, we won't allow anyone to move outside any arbitrary lines we make because once you cross those lines, we know we can't get you back. And I will give you an example, an analogy: This is like somebody using a passing lane or going into the other lane to pass. We do that all over this country. But once you start allowing people to claim a right for using a right of way that was not set aside for them, the only alternative is to eventually for the government to put up regulatory jersey walls to where that option is no longer available in the future. Even though no one is using that lane 99 percent of the time because we won't enforce it when somebody wants to use the lane, we have got to block it off, and that asset is not going to be used with flexibility. We are going to become intransigent at bureaucratic lines. So I think that we have got to recognize this issue was very strongly setting an example to the next group that bids on something, are we going to apply it and be flexible and thus when the time comes, are we going to implement it, or are we going to create the barriers. Isn't this a situation of squatting and squatters' rights, and how do we tell anybody when they do bids, that there is not going to be a squatter sitting on their spectrum if we don't straighten this thing out and make it clear to everybody that the Federal Government will make you whole and will not allow squatting to supersede the due process that we set aside? How do we avoid that?

Mr. KNAPP. Well, first of all, as we conduct our processes, they are open, and it is incumbent on all the parties to participate in that. This situation has been, in my 38 years at the FCC, an anomaly. Almost invariably, the parties come in and explain——

Mr. BILBRAY. OK. When the parties explain this—let me interrupt one second. When they talk about interference, are you saying, wait a minute, is there interference, or is there—does the—is it harmful interference? There is one thing to have static with GPS. There is something else to be blocking the GPS. Isn't it true that the, quote-unquote, interference may not be harmful interference that would block the item. It may give some difficulty but still won't be able to block the service; the service still gets through with GPS. Isn't that true?

Mr. KNAPP. This is one of the issues that has been raised, and it is one of the core issues that the commission routinely has to address in deciding whether interference is harmful or not. We also have to take into account, when we are dealing with public safety services or defense, a much higher threshold for ensuring against problems.

Mr. BILBRAY. OK. There is the problem. We are now creating the issue of that we will go so far because we think it is a public safety

issue, and once you name that, if somebody that has run police departments and sheriff departments, the question is, does that become now the excuse to use that lane all the time, even without a red light running, even though it is not a code three, because we are public safety, we get to drive in the left lane all the time, without having to show that there was reasonable application here? And that is what I am concerned about. And let me tell you something, as someone has run police departments, that happens all the time, you know. But we don't sit there and continue to allow it just because somebody claims it. They need to prove it. And that is that harmful interference. When will you get that clarified, and what is your obligation to make sure that we make this whole so this Congress and future Congresses don't have to start building jersey walls and blocking off all kinds of great flexible opportunities because we have seen what happened with LightSquared, so we are not going to allow any flexibility in the future? How do we maintain that flexibility?

Mr. KNAPP. So this issue I think has given greater focus to receivers and the issue of staying in your lane. And we conducted a workshop at the commission on addressing receiver standards going forward. Just this past March, we have tasked our Technological Advisory Committee, which includes experts across industry, to make recommendations on how we can deal with these kinds of issues in the future as we are making spectrum allocation, so we are working on it.

Mr. BILBRAY. Thank you very much.

Mr. Chairman, what he just told me is, now, they are going to be harder and put up a jersey—basically block it off, that flexibility to avoid this problem. That is exactly what I want to avoid, and that is why we should be working to straighten this out so they don't have to start putting up those jersey walls, and we maintain our flexibility. I think both sides want that.

I yield back.

Mr. STEARNS. I thank the gentleman for his insight.

And the gentlelady from Tennessee, Mrs. Blackburn, is recognized for 5 minutes.

Mrs. BLACKBURN. Thank you.

And Mr. Chairman, I do want to take a moment and just thank you for your leadership. You are going to be missed. We are all going to miss you and appreciate the leadership and guidance you have given this committee on so many issues.

To our witnesses, we are going to have votes called in just a few minutes, and I want everyone to have the opportunity to get through their questions. I want to talk with you specifically about your February 10th memo, or it is an email from February 10th, and the March 26, 2010, order dealing with preventing SkyTerra from making its ATC spectrum available to AT&T and Verizon.

So let's start, Ms. De La Torre, with you with that February 10th email from Joel Rabinovitz. You are on that email, correct? You are a recipient of that? It is Exhibit 9 in your binder.

Ms. DE LA TORRE. Yes, I was aware of that.

Mrs. BLACKBURN. Would you please speak into the microphone?

Ms. DE LA TORRE. Yes, I am on that email, but I wasn't participating in the email as far as sending, responding to it. I am on it, though.

Mrs. BLACKBURN. OK. But you read in there that, and I am quoting from the email, the condition is that Harbinger not sell to Verizon and AT&T. So is this email consistent with your thoughts regarding the purposes of the conditions?

Ms. DE LA TORRE. Thank you, Congresswoman.

In fact, where we ended up was not where the email started actually. We ended up—there was a loophole in the FCC's sort of framework for secondary markets of spectrum. And terrestrial systems at the time could use secondary markets, and they could lease their spectrum, but MSS operators could not. And so one of the reasons that we had wanted to put this condition in on AT&T and Verizon, it didn't prohibit them from actually gaining access to that spectrum, but it said that the FCC needed to be notified of that. And I think that that just basically filled in a gap in our rules that we then actually changed the rules later in the following year, in April 2011, to apply it to the mobile satellite service as well. So AT&T and Verizon, just to be clear, were not prevented from actually accessing that spectrum; they just had to give notification of that.

Mrs. BLACKBURN. OK. Well, let me ask you this then. Do you think it should be common practice for the FCC to impose conditions like this when it really—so that it affects the rights of nonparties to a proceeding? Should that be common practice of the FCC? Should they move forward in that vein?

Ms. DE LA TORRE. I have been at the commission for 3 years, and during that time, in most of the transactions that we have worked on, we have conditions that are applied. And they are specific to the particular transaction, and I think that is what we did here as well.

Mrs. BLACKBURN. OK. Let's talk about Globalstar for a second. I have got a couple of questions I wanted to ask about that. On June 30, 2010, the FCC granted Globalstar an extension of its deadline to come into compliance with the ATC gating criteria until August 2nd of 2010. Despite the fact that the FCC granted Global Star's 30-day extension the RUS suspended Open Range's future loan advances on July 14, 2010, and threatened to suspend its remaining funds unless it found an alternative spectrum partner. So, during this period, were there any conversations between the FCC and RUS or the FCC and the White House discussing the possibility that LightSquared could serve as an alternative spectrum partner to Open Range?

Ms. DE LA TORRE. Thank you, Congresswoman.

I was not a party to any of those conversations. If they were held, I was not a party to them.

Mrs. BLACKBURN. Were you aware that there were any?

Mr. Knapp, do you want to respond to that?

Mr. KNAPP. I just wanted to add that neither was I.

Mrs. BLACKBURN. OK. You were not a party to them or you were not aware that they were taking place?

Mr. KNAPP. I was not aware that they were taking place.

Ms. DE LA TORRE. Either one.

Mrs. BLACKBURN. Thank you.

My time is expired. I yield back.

Mr. STEARNS. I thank the gentlelady.

And the gentleman from Virginia, Mr. Griffith, is recognized for 5 minutes.

Mr. GRIFFITH. Thank you, Mr. Chairman.

Let me echo the comments of my colleagues on how much I, particularly as a freshman, have appreciated your leadership, and I have learned a great deal from you, and I am kind of hopeful we will have some more hearings. But in the event that we don't, let me add my comments to those of my colleagues and how greatly I appreciate your leadership. Thank you.

That being said, if I might ask, how does the FCC define harmful interference? And let me do some subparts on that. Is the level of harmful interference specific to each GPS device, or is there a particular industry standard that defines whether interference is harmful? Is any interference harmful? Who makes the decision at what level it is harmful? Is that the FCC or is that the GPS device manufacturer or user? And is the design of the receiver relevant to the determination of harmful interference? And be happy to repeat the subparts if you need me to. But the base question is, how do you determine harmful interference, and who makes those decisions?

Mr. KNAPP. First, I would be more than happy to provide the precise language of the definition in the commission's rules. It is consistent with the international definition. It generally, in lay terms, is, it is subjective. It talks about repeated disruption of a service, particularly in the context of safety and navigation services as well. So the definition itself gives deference to the importance of protecting safety services.

In the case of GPS, there are multiple kinds of receivers. So, in some instances, there are industry standards. So, for example, for the GPS chips that are used in cell phones for 911 location, there are industry standards that are in place. As commented, I think in the letter that we received forwarding the test results from NTIA, there is no accepted standard for general navigation equipment. There is a standard for aeronautical, and so I will stop there. So, in some cases, there are standards and others not, and the criteria for determining what is helpful is not always consistent. Is there a question I missed?

Mr. GRIFFITH. Yes. How is the filter designed relevant to that——

Mr. KNAPP. Filter design comes into play usually at the intersection between two adjacent bands. So it is not unusual to have some play, some flexibility, between the services right at the borders. And normally, those problems are solved between the parties themselves. We have to look at the overall characteristics of the equipment and the service and what it is capable of doing in making decisions like this as to what is harmful or not.

Mr. GRIFFITH. And this is one that has always got to bother you, and for centuries, the law has tried to figure out on different items how to make this work. But the FCC has relied on the fact that no party raised the overload interference issue until late 2010 to account for its late consideration by the FCC. And I have to ask,

what standards of timeliness does the FCC have? I mean, oftentimes, if you don't raise an objection in other areas of the law, you lose them, and whether it is the statute of limitations or the theory of latches, you have a timeliness issue. So what is the FCC's rule on that?

Mr. KNAPP. So we are governed by the public interest standard. And in this case, although it is a very difficult situation, we cannot put at risk things like air safety or defense or 911 systems and so forth. So we have to be very careful when we evaluate those kinds of situations.

Mr. GRIFFITH. Mr. Chairman, I have no further questions at this time and yield back.

Mr. STEARNS. I thank the gentleman. I think what we are going to do is I am going to have a second round, and the ranking member has a very short question, too, and then we will adjourn the committee.

So my question is to Mr. Knapp. Obviously, a company has lost $4 billion, a huge amount of money. The technology they had was a game changer. The whole thing has been scuttled. And so what we are trying to do now is understand what solutions are available.

So, Mr. Knapp, the Technical Working Group and the PNT ExCom both conducted interference testing on multiple types of GPS devices. Is that correct, yes or no?

Mr. KNAPP. Yes.

Mr. STEARNS. How many different types of GPS receivers did the Technical Working Group test, actually test.

Mr. KNAPP. They tested a pretty significant number of each different type. So for cell phones, for example, and for the personal navigation devices, I believe it was well over 75 or so.

Mr. STEARNS. Seventy-five, OK. How many different types of GPS receivers did the PNT ExCom test?

Mr. KNAPP. As broad categories, I believe there were six or seven different categories.

Mr. STEARNS. In the Technical Working Group testing, what types of GPS devices were deemed susceptible to harmful overload interference?

Mr. KNAPP. So the report from NTIA commented that the cell phones—well, for any device if they get close enough, you can have interference, but the cell phones appeared to be OK. That there was concern that 75 percent of the—and I am just reciting what the report said—75 percent of what are called the general navigation devices. In the case of aeronautical, the judgment was against an industry standard.

Mr. STEARNS. Were there certain types of GPS receivers that did not receive harmful interference from LightSquared's signal, yes or no?

Mr. KNAPP. Yes.

Mr. STEARNS. What standard was used to determine harmful interference in the Technical Working Group's testing?

Mr. KNAPP. So there were different standards for each of the different working groups. In the case of cell phones, they used the worldwide standards developed by a group called the 3G PP, which is Third Generation Partnership. There were no standards for gen-

eral navigation. They used a standard for the aeronautical equipment based on the radio technical.

Mr. STEARNS. What is the FCC's responsibility to oversee the working group?

Mr. KNAPP. So, in this case, we did what we often do; we brought all of the parties together through this process with the——

Mr. STEARNS. So you are a facilitator and not much more? You are not an investigator, oversight or an enforcer——

Mr. KNAPP. Part of the rationale here is we want to be careful not to steer the work of the group, because in the end we may have to make a decision and assess its work.

Mr. STEARNS. I understand.

Who provided the devices for the Technical Working Group testing?

Mr. KNAPP. That came from the working group itself, which was co-chaired by the GPS industry and LightSquared.

Mr. STEARNS. In the PNT ExCom testing, what types of receivers were deemed susceptible to harmful overload interference?

Mr. KNAPP. So, just to be clear, there was a first round of testing. And in the second round, all that was looked at was cell phones and general navigation devices and then a particular class of aeronautical equipment that was used for mapping terrain.

Mr. STEARNS. I think I have asked this before, but certain types of GPS receivers, weren't some of them—did not receive harmful interference from LightSquared? Isn't it true some of them did not, isn't that true?

Mr. KNAPP. Yes.

Mr. STEARNS. Would you say there are a lot of receivers that did not receive it, or was it significant, would you say significant?

Mr. KNAPP. So it varied across the categories. And one of the categories that was particularly not covered in the second round was called high-precision equipment. And that is some of the equipment that is designed actually to operate across both bands together.

Mr. STEARNS. If harmful interference was not observed in a particular category of GPS devices, does that mean a potential solution might exist for that category?

Mr. KNAPP. Well, for the equipment that didn't experience harmful interference, yes, there is a solution for that category.

Mr. STEARNS. In your mind's eye, can this problem be solved?

Mr. KNAPP. I think the——

Mr. STEARNS. Just yes or no.

Mr. KNAPP. I can't answer yes or no because just as when we went into this, until you work through the problems, you don't know the answer.

Mr. STEARNS. Well, describe what your solution would be?

Mr. KNAPP. I can't describe what my solution would be. I know that there are ideas that are on the table that we are considering.

Mr. STEARNS. And do you endorse any of those ideas?

Mr. KNAPP. No, we have an open proceeding. It would prejudice the outcome for me to endorse one or the other.

Mr. STEARNS. Well, as an electrical engineer, don't you think this could be solved?

Mr. KNAPP. As an electrical engineer, we always strive to solve the problem, but there is no certainty that you are going to.

Mr. STEARNS. You got to pass the exam. It is either yes or not. All right. Well, as I say, you know, I am just—I think all of us are a little frustrated with this huge possible innovation leap here in the loss of this company. So, anyway, my time is expired.

Ms. DEGETTE. Mr. Chairman, first of all, I would like to ask unanimous consent to put the spectrum chart into the record, which I had shared with your staff.

Mr. STEARNS. By unanimous consent, it will be made part of the record.

[The information follows:]

# Selected VHF and UHF Frequency Bands

(2290-2700 MHz band and key on reverse side)

Federal Communications Commission
Office of Engineering and Technology
March 2012

## 50-225 MHz (175 MHz):

50 54 72 76 88 108 138 144 150.8 162.0375 174 216 225

- Amateur Radio (1.8 MHz)
- VHF TV Channels 2-4: 54-72 MHz (18 MHz)
  - Fixed TVBDs
  - 2012 Act: TV spectrum subject to incentive auction
- Land Mobile (72-76 MHz)
- Amateur Radio (74.8-75.2 MHz)
- VHF TV Channels 5-6: 76-88 MHz (12)
  - Fixed TVBDs
  - 2012 Act: TV spectrum subject to incentive auction
- Land Mobile (88-108 MHz)
- FM Radio Stations: 88-108 MHz (20 MHz)
  - Reservation for EBS
  - 100 channels x 200 kHz (88.1, 88.3, ...107.9 MHz)
- ARNS: 108-117.975 (9.975 MHz)
- Aeronautical Mobile: 117.975-137 MHz (19.025 MHz)
- Land Mobile (137-138 MHz)
- Fed. FS & MS: 138-144 MHz (6)
- Amateur Radio (144-148 MHz)
- Land Mobile (148-150.8 MHz)
- Fed FS & MS (150.8-162.0375 MHz)
- EMS: 150.8-154.0375 (3.3 megahertz)
- Land Mobile: 154.0375-162.0375 MHz
- Maritime Mobile (including AIS: 161.975, 162.025 MHz)
- Fed FS & MS (162.0375-173.2 & 173.4-174 MHz) (11.7625 MHz)
  - Also non-Federal use of certain frequencies
- Land Mobile (173.2-173.4 MHz)
- VHF TV Channels 7-13: 174-216 MHz (42 MHz)
  - Fixed TVBDs
  - 2012 Act: TV spectrum subject to incentive auction
- Land Mobile (216-220 MHz)
- Fed. LMS, Maritime Mobile, Amateur (220-222 MHz) (2)
- Amateur Radio (222-225 MHz)

## 470-894 MHz (424 MHz):

470 608-614 698 746 776 806 894

- UHF TV Channels 14-51 (38 channels x 6 MHz = 228 MHz)
  - Note: The 608-614 MHz band (TV Channel 37) is allocated to the Radio Astronomy Service (RAS) and Wireless Medical Telemetry Service (WMTS).
  - Channels 14-20: 470-512 MHz (42 MHz)
    - PLMRS in 11 cities
    - 2012 Act: Public safety subject to relocation.
    - Fixed TVBDs
  - TV Channels 21-36: 512-608 MHz (96 MHz)
    - Fixed & Personal/portable TVBDs
  - RAS, WMTS
  - TV Channels 38-51: 608-698 MHz (84 MHz)
    - Fixed & Personal/portable TVBDs
  - 2012 Act: TV spectrum subject to incentive auction.
  - (The FCC's National Broadband Plan recommended initiating a proceeding to reallocate 120 MHz of TV spectrum.)
- Lower 700 MHz: 698-746 MHz (48 MHz) (former TV Channels 52-59)
  - A (6 MHz) B (6 MHz) C (6 MHz) D (6 MHz) E (6 MHz) A (6 MHz) B (6 MHz) C (6 MHz)
- Upper 700 MHz: 746-806 MHz (60 MHz) (former TV Channels 60-69)
  - C (1 MHz) 746-757 MHz
  - Public Safety 758-775 (17 MHz)
  - Guard Band
  - C (1 MHz) 775-787 MHz
  - Public Safety 788-805 (17 MHz)
  - Guard Band
- PLMRS: 806-817 MHz (11 MHz)
- Cellular and ESMR 817-849 MHz
  - ESMR (7 MHz)
  - A (1 MHz) 814-815 MHz
  - B (10 MHz) 824-845 MHz
  - Guard Band
- PLMRS: 851-862 MHz (11 MHz)
- Cellular and ESMR 862-894 MHz
  - ESMR (7 MHz)
  - A (1 MHz) 869-870 MHz
  - B (10 MHz) 880-890 MHz
  - Guard Band

716

Guard Band Blocks A (757-758/787-788 MHz) and B (775-776/805-806 MHz)

## 1435-1850 MHz (415 MHz):

1435 1525 1559 1610 1626.5 1660.5 1675 1695 1710 1755 1850

- Aeronautical Mobile Telemetry (AMT) ↓: 1435-1525 MHz (90 MHz)
- L-Band MSS ↓: 1525-1559 MHz (34 MHz)
  - ATC
  - ATC
- RNSS ↓ (*i.e.* GPS) ARNS: 1559-1610 MHz (51 MHz)
  - GPS L1 = 1575.42 MHz
- Big LEO MSS: 1610-1626.5 MHz
  - Uplink ↑
  - Downlink ↑↑
  - ATC
- L-Band MSS ↑: 1626.5-1660.5 MHz (34 MHz)
  - ATC
  - ATC
- Fixed & Mobile (1660.5-1675 MHz)
- MetSat ↓ MetAids: 1675-1695 MHz (20 MHz)
- Gov't Transfer (1695-1710 MHz) (15 MHz)
- AWS-1 ↑: 1710-1755 MHz (45 MHz)
  - A (10) B (10) C (5) D (5) E (5) F (10)
- Federal Exclusive Band: 1755-1850 MHz (95 MHz): Fixed and Mobile
  - 1761-1842 MHz: Space Operation ↑

ATC: 1526-1536 & 1545.2-1555.2 MHz

ATC: 1627.5-1637.5 & 1646.7-1656.7 MHz

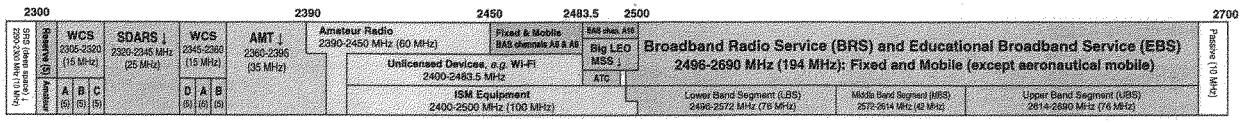
ATC: 1610-1617.775 & 1621.35-1626.5 MHz

## 1850-2290 MHz (440 MHz):

1850 1915 1930 1995 2025 2110 2155 2180 2200 2290

- Broadband PCS ↑: 1850-1915 MHz (65 MHz)
  - A (15) D (5) B (15) E (5) F (5) C (15) G (5)
- AWS-2 H block (5) ↓
- Unpaired PCS (10)
- Broadband PCS ↓: 1930-1995 MHz (65 MHz)
  - A (15) D (5) B (15) E (5) F (5) C (15) G (5)
- AWS-2 H block (5) ↑
- 2 GHz MSS ↑: 2000-2020 (20 MHz)
  - ATC
  - Fixed & Mobile
- AWS-2 J block (5) ↓
- Unified S-Band
- 2 GHz BAS ↑ (*e.g.* news gathering)
  - EESS, SRS, Space Operation (all ↑ & limited)
  - 2025-2110 MHz (85 MHz)
  - 7 BAS channels (12 MHz each) plus 1 MHz for response channels
  - A1r A2r A3r A4r A5r A6r A7r
- AWS-2 J block (5) ↑
- AWS-1 ↓: 2110-2155 MHz (45 MHz)
  - A (10) B (10) C (5) D (5) E (5) F (10)
- AWS-3: 2155-2175 (20 MHz)
- AWS-2 J block (5) ↑
- 2 GHz MSS ↓: 2180-2200 (20 MHz)
  - ATC
  - Fixed & Mobile
- Federal Exclusive Band: 2200-2290 MHz (90 MHz)
  - Fixed & Mobile (both line-of-sight only)
  - EESS, SRS, and Space Operation (all ↓)

## 2290-2700 MHz (410 MHz):




Notes:

BAS chan. A10 .... BAS use of channel A10 (2483.5-2500 MHz) is limited to grandfathered licensees.
Big LEO MSS ..... MSS operations in the 1610-1626.5 MHz and 2483.5-2500 MHz bands.
DISH ..... On March 12, 2012, DISH Network Corporation completed its acquisition of DBSD and TerreStar, the former 2 GHz MSS licensees.
Globalstar ..... Big LEO licensee that operates MSS FDD system in the 1610-1618.725 MHz Uplink band and the 2483.5-2500 MHz Downlink band; MSS reception of the 2495-2500 MHz band is not protected from interference caused by BRS operations.
Iridium ..... Big LEO licensee that operates MSS TDD system in the 1617.775-1626.5 MHz band.
L-Band MSS ..... MSS operations in the 1525-1559 MHz Downlink band and the 1626.5-1660.5 MHz Uplink band.
Little LEO MSS..... MSS operations in the 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, and 400.15-401 MHz bands.
Unified S-Band ..... Federal use of the Space Operation Service in the 2025-2110 MHz (instead of the 1761-1842 MHz) Uplink band and the 2200-2290 MHz Downlink band.
216-222 MHz ..... The Low Power Radio Service (LPRS) operates in the 216-217 MHz band; the Automated Maritime Telecommunications System (AMTS) operates in the 216-218 MHz and 219-220 MHz bands; FS & MS operate in the 218-219 MHz band (218-219 MHz Service); amateur stations participating as forwarding stations operate in the 219-220 MHz band; and FS & LMS operate in the 220-222 MHz band (220 MHz Service).
1695-1710 MHz ... NTIA has identified this band as a Government transfer band and states that 18 critical sites must be protected (14 in the contiguous U.S., 2 in Alaska, 1 each in Hawaii and Guam); the radius of these areas may be as large as 121 km.

| Acronym | Term |
|---|---|
| A/G | Commercial Aviation Air-Ground Systems (ground stations transmit in the 849-851 MHz band and aircraft stations transmit in the 894-896 MHz band) |
| AIS | Automatic Identification System (use of the Maritime Mobile Service in the 161.9625-161.9875 MHz and 162.0125-162.0375 MHz bands is limited to AIS) |
| AMT | Aeronautical Mobile Telemetry |
| ARNS | Aeronautical Radionavigation Service |
| ATC | Ancillary Terrestrial Component |
| AWS | Advanced Wireless Service |
| BAS | Broadcast Auxiliary Service |
| BRS | Broadband Radio Service |
| EBS | Educational Broadband Service |
| EESS | Earth Exploration-Satellite Service |
| ESMR | Enhanced Specialized Mobile Radio |
| FDD | Frequency Division Duplex |
| FS | Fixed Service |
| GPS | Global Positioning System (L1 is one of several GPS satellite transmit frequencies) |
| ISM | Industrial, Scientific, and Medical (ISM equipment is authorized under Part 18 of the FCC's Rules) |
| LEO | Low Earth Orbit |
| LMS | Land Mobile Service |
| MetAids | Meteorological Aids Service |
| MetSat | Meteorological-Satellite Service |
| MS | Mobile Service (consists of the Aeronautical Mobile, Land Mobile, and Maritime Mobile Services) |
| MSS | Mobile-Satellite Service |
| PCS | Personal Communications Service |
| PLMRS | Private Land Mobile Radio Service (includes the Public Safety and Industrial/Business Radio Pools) |
| RNSS | Radionavigation-Satellite Service |
| SDARS | Satellite Digital Audio Radio Service (includes terrestrial repeaters) |
| SRS | Space Research Service |
| TVBDs | Television Band Devices (also referred to as TV Whitespace devices)(may operate on any unused TV channel, except for TV Channels 3, 4, and 37) |
| WCS | Wireless Communications Service |

| Symbol | Term |
|---|---|
| ↓ | Downlink (from a base station or satellite to a fixed or mobile station) |
| ↑ | Uplink (from a fixed or mobile station to a base station or satellite) |
| ↑↓ | Time Division Duplex (TDD) |

**Key**

- Aeronautical Mobile and Maritime Mobile Services
- Broadcasting (TV and FM radio)
- Candidate expansion bands for Wireless Broadband Services
- Part 15 unlicensed devices, Part 18 ISM equipment, and Amateur Radio Service
- Federal (Fed.) exclusive bands, passive bands, and bands not otherwise categorized
- PLMRS (except for quasi-Cellular "Block C", *i.e.*, ESMR operations in the 817-824 MHz and 862-869 MHz bands)
- Satellite services
- Wireless Broadband Services (Fixed & Mobile)

Ms. DEGETTE. Thank you.

I also understand that you are going to put the exhibit notebook into the record, subject to some redactions that will be agreed upon by staff.

Mr. STEARNS. That is correct.

Ms. DEGETTE. I would just ask unanimous consent that we put Ms. De La Torre's memo Exhibit 1 in the exhibit book in without redaction.

Mr. STEARNS. Unanimous consent, so ordered.

[The information appears at the conclusion of the hearing.]

Ms. DEGETTE. Thank you very much.

I just want to say I don't have any questions, you will be happy to know. But I just want to say that this entire hearing really highlights the urgency of the work that the Select Working Group that Chairman Upton put together and which I was privileged to serve, a subcommittee—select subcommittee of this full committee, because as we look more and more at the use of spectrum and as we look at increasing demands on our spectrum, we are really going to have to figure out how we balance really important legitimate commercial needs, like in this situation with LightSquared, with GPS and other security needs and so on. And I think that that work that the select working group has been doing throughout the spring, summer, and fall has real urgency, and I am sure that the FCC would agree with that.

And Mr. Chairman, I look forward to working in the next session of Congress on both sides of the aisle to start to figure out what we do with some of these issues. Because, unfortunately, I think it was Mr. Knapp who said that in his 30-plus years at the agency, he hasn't seen a situation like this. But I think everybody would agree if we can't start to think about what we are doing with our spectrum, we are going to see more and more situations and more and more demands bumping up against each other.

I see both of our witnesses nodding their heads yes.

So thank you for having this hearing, and I look forward to continuing to work with you.

Mr. STEARNS. I thank the gentlelady.

I thank the witnesses for their testimony this morning.

In conclusion, I would like to thank all the members for staying here. I remind members they have 10 business days to submit questions for the record.

And I ask the witnesses to all agree to promptly respond to these questions.

And with that, this is my last hearing as a Member of Congress, and I just want to thank the members on both sides for their participation and, more importantly, the staff. The staff has done a great job throughout my tenure as chairman of the Oversight Committee, and I appreciate all their hard work.

[Whereupon, at 10:35 a.m., the subcommittee was adjourned.]

# Exhibit List

1. E-mail from Mindel De La Torre, Chief, International Bureau, FCC, to Julius Knapp, Chief, Office of Engineering & Technology, FCC et al. (Aug. 4, 2011, 7:34 P.M.).

2. LightSquared Subsidiary LLC, *CMRS Coordination* (July 2010).

3. Memorandum from John Leibovtiz, Deputy Chief, Wireless Competition Telecommunications Bureau, FCC, to Julius Genachowski, Chairman, FCC (Sept. 2, 2009).

4. E-mail from Mindel De La Torre, Chief, International Bureau, FCC, to Roderick Porter, Deputy Chief, International Bureau, FCC (Nov. 24, 2010, 12:39 PM).

5. Memorandum from Jim Bird, Senior Counsel, FCC et al., to Julius Genachowski, Chairman, FCC et al. (Sept. 2, 2009).

6. Memorandum from Mark Uretsky & Marilyn J. Simon, Senior Economists, International Bureau, FCC, to Jonathan Baker, Chief Economist, FCC (Sept. 16, 2009).

7. E-mail from Jonathan Baker, Chief Economist, FCC, to Mark Uretsky & Marilyn J. Simon, Senior Economists, International Bureau, FCC (Oct. 1, 2009, 8:26 AM).

8. Undated FCC document discussing Business Plan of Harbinger Capital Partners.

9. E-mail from Joel Rabinovitz, Office of Gen. Counsel, FCC, to Mindel De La Torre, Chief, International Bureau, FCC et al. (Feb. 10, 2010, 11:24 AM).

10. Undated FCC document entitled "Discussion of Possible Conditions."

11. Harbinger Capital Partners, *Reshaping the Wireless World* (n.d.).

12. FCC, *Possible Enforcement Actions Against Harbinger Capital Partners Funds* (n.d.).

13. E-mail from Robert Nelson, Chief, Satellite Division, International Bureau, FCC, to Roderick Porter, Deputy Chief, International Bureau, FCC et al. (July 22, 2010, 7:10 AM).

14. E-mail from Paul de Sa, Chief, Office of Strategic Planning, FCC, to Jonathan Adelstein, Administrator, Rural Util. Serv., USDA (Sept. 14, 2010, 12:01 AM).

# Exhibit 1

**Kim Mattos**

**From:** Mindel DeLaTorre
**Sent:** Thursday, August 04, 2011 7:34 PM
**To:** Amy Levine; Rick Kaplan; Tammy Sun; Julius Knapp; John Leibovitz; Paul de Sa
**Cc:** Josh Gottheimer; Neil Grace; Edward Lazarus; Roderick Porter
**Subject:** I could post the following blog...

They've pushed me over the edge -- I'd be happy to post the following blog -- Julie can correct any of my inaccuracies before it goes up, but I am happy to take the blame.

Beware of the GPS double wide trailer!

Enough is enough. The amount of misinformation about LightSquared and its effects on GPS receivers, about the FCC's dubious processes, about what the FCC has authorized LightSquared to do is unbelievable. Every day the misinformation becomes more ridiculous.

One of today's reports claims that a waiver order that the FCC granted in January this year is going to cause 800 deaths due to loss of access to GPS satellites by the air traffic system. Do they really think that we sit at the FCC and try to figure out how to authorize systems that interfere with ubiquitous GPS receivers?

Let me explain the situation in the most elementary and visual way that I can without a picture. The FCC authorizes various operators to provide service by using spectrum or radiowaves. In order to make sure that there is no interference, we assign specific frequencies to particular licensees. In this case, think of it as a three lane highway. The FCC has authorized LightSquared – a satellite system that also has a terrestrial component – to use the left lane. The middle lane is where GPS is authorized to operate, and the right hand lane is where another satellite operator (Globalstar) has its services. Notice that I say that GPS is authorized to operate in the middle lane – however, it has not been staying in its lane. It has been driving in the left lane with impunity – remember this is LightSquared's lane -- but now that it looks like the left hand lane might actually have traffic in it, the GPS community is yelling bloody murder (literally). The GPS community is not worried about LightSquared driving in the GPS middle lane, but that LightSquared will interfere with the GPS signals that are leaking into LightSquared's left lane.

The GPS community has been on notice since 2003 that the predecessor to LightSquared was planning on providing terrestrial service in the left traffic lane -- which would mean there would be more traffic in the lane. However, the GPS community continued to build receivers that they knew were susceptible to interference (remember that they are driving in the wrong lane) because it was cheaper to do so and they decided to accept the business risk of doing so. In a nutshell, the GPS community feels that they should be able to drive their double wide trailer down the middle and left lanes without regard to LightSquared's longstanding right to be in the left lane.

Now that there are hundreds of thousands of GPS receivers using LightSquared's left hand lane – do you know anyone who doesn't have one – the FCC is in a very difficult position. We have a licensed operator who is being told that it cannot operate in the frequencies (or lane) that it is authorized to use because it will interfere with critical aviation, military, boating, farming and the list goes on of GPS enabled services – all now driving in LightSquared's lane. Of course, the FCC doesn't want to do anything to affect those services. This is exactly why after the GPS community came in at the last minute to raise their concerns, we prohibited LightSquared from operating under the waiver until the GPS concerns were remedied. We are often accused of having allowed LightSquared to operate a new terrestrial only service at the expense of GPS. This is simply not true. In fact, one could say that our conditional waiver was a stop service order. LightSquared is not allowed to operate until we say they can...even though they have had authorization to operate in that left lane since 2003.

This is a very complicated issue – and tough choices will need to be made – and may in fact change the established rules of the road. But, how many times do we need to reiterate, we will not endanger one person on an airplane, one soldier, one boater or driver who relies on their GPS service. What I would like is for us to stop the vitriolic and patently false accusations. We at the FCC see the double wide GPS trailer in the rear view mirror and we need to figure out what to do about it...give us time to do the right thing without spreading more misinformation.

# Exhibit 2

# CMRS Coordination

July 2010

LightSquared

# CMRS Coordination Requirement

Section 25.253(c)(2) requires LightSquared to:

"coordinate with terrestrial CMRS operators prior to initiating ATC transmissions when co-locating ATC base stations with terrestrial commercial mobile radio service (CMRS) base stations that make use of Global Positioning System (GPS) time-based receivers."

This requirement is independent of the OOBE limit for base stations (-100dBW/MHz into the GPS band)

# Receiver Overload Issue

After conducting extensive tests, LightSquared believes that most of the GPS timing devices CMRS carriers are currently using lack front-end filtration of any kind

These receivers will be highly susceptible to front end overload when they are located in the main beam of a LightSquared transmit antenna to a distance of approximately 218 meters

- Rooftop installations are believed to be most susceptible
- Tower collocations may be less so since GPS antennas typically are located near the base of the tower, which is usually within the null area of the transmit antenna pattern

LightSquared's expectation is that most carriers will choose to replace any GPS antennas/receivers that are potentially vulnerable

GPS antennas that have adequate filtering to prevent receiver front-end overload are now available; these antennas will operate at a separation distance of two meters from a LightSquared transmit antenna

The cost to CMRS carriers to replace these antennas is expected to be $100 each, plus 1-2 hours of labor per GPS antenna

# Network Deployment

Initial RF Design is Complete and Site Acquisition is Underway

| Market | Estimated Commencement Date of RF Testing |
|---|---|
| Las Vegas | December 1, 2010 |
| Phoenix | January 1, 2011 |
| Denver | March 1, 2011 |
| Baltimore | March 1, 2011 |
| Washington | Q4 2011 |
| Seattle | Q4 2011 |

- Over 1,300 search rings are now being worked by site acquisition vendors and tower companies
- Several additional markets scheduled for search ring release by the end of August

Nokia Siemens Networks is the network infrastructure provider and will provide turnkey deployment services

LightSquared

# Next Steps

Identify all CMRS carriers in markets where testing or operations are expected to begin in 2010 or 2011

Begin coordination for first four markets by end of August

- Initially provide geographic "Areas of Interest" and a White Paper explaining the issue
- Later provide more specific information as necessary to assist CMRS carriers in the prioritization of their antenna replacement activities (e.g. specific site locations, antenna centerlines)
    - Information to be provided at appropriate site development milestone (e.g. lease execution) [no less than 15 days before beginning operation at a site]
    - Information to be updated on a timely basis should material elements change

# Exhibit 3

*Confidential Memorandum – Internal Use Only*

To: Chairman
From: John Leibovitz
Date: September 2, 2009
Re: MSS/ATC Strategic Issues

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The MSS spectrum bands represent some of the largest tranches of underutilized spectrum that could readily be repurposed for broadband use. All 40 MHz in the S-Band and potentially, over time, up to 66 MHz in the L-Band could be used for broadband services, either via satellite or via cellular technology under the ATC rules with appropriate rule changes. Therefore, the bands should be viewed as a strategic component of the Commission's spectrum strategy and an important component of the National Broadband Plan.

In evaluating options for the bands, the Commission will have to consider several factors. First, and perhaps most importantly, the Commission should look at ways to ensure these bands, which have generally lain fallow for several years, are used productively for mobile broadband in the near term. Second, the Commission will have to weigh the productivity / efficiency gains of increased spectrum utilization against potential equity considerations of providing a "windfall" to companies who did not acquire the licenses at auction. Third, the Commission will need to consider the importance of continuing to ensure satellite operations in the bands, to the extent this conflicts with or encumbers terrestrial operations. Fourth, the Commission should consider the effects of new spectrum on the competitive structure of the wireless market, especially in light of existing MSS partnerships with incumbent wireless providers. Finally, the Commission will have to consider interference scenarios both within the bands and into adjacent bands.

Key Decisions

Fundamentally, there are three decisions to make about which strategic course to follow with respect to MSS bands:

1. *Should the Commission "double down" on mobile satellite service in the MSS bands?* Satellite service is the authorized use of the bands and current policy reflects a view that demand is robust enough to support multiple competitors in different bands. The slow development of the bands and the consolidation of the spectrum in the hands of fewer MSS licensees suggest that the envisioned market has not emerged. Nonetheless, before proceeding to consider ways to increase terrestrial use of the spectrum, we should make a decision about the prospects for satellite services. *Preliminary viewpoint: do not double down, proceed to decision #2.*

2. *Should the Commission seek to reallocate MSS spectrum to terrestrial use?* The most direct way to repurpose the spectrum for terrestrial (cellular) use would be to reallocate the spectrum. This is a more viable option in the S-Band than in the L-Band. The ITU has designated S-Band spectrum as having two "co-primary"

allocations: MSS and terrestrial mobile use. In the U.S., the spectrum is presently authorized for MSS, but the FCC has authority to create a mobile terrestrial co-primary authorization. In contrast, the ITU has designated the L-Band spectrum as a MSS-only band. Therefore, to change the underlying allocation in the U.S. would require changes at the ITU, which could take many years. *Preliminary viewpoint: do not reallocate, proceed to decision #3.*

3. *Should the Commission increase the viability of terrestrial use within the context of the existing MSS allocations?* A less direct, but probably more practical approach is to look for ways to authorize and create market incentives for investment in terrestrial networks, without changing the underlying allocations. This might, for example, involve changes to the ATC rules and use of secondary market leases to spur investment. *Preliminary viewpoint: most viable approach, develop further using levers described below.*

Policy Levers

The FCC has several policy levers at its disposal to steer the MSS bands toward more productive use. These include:

1. *Rule changes.* Modification or clarification of rules could provide flexibility and certainty required for widespread terrestrial deployment using the spectrum. The biggest regulatory levers are probably: (a) changing the ATC handset requirements to relax the requirement for a satellite capability in all handsets and (b) establishing a leasing framework to create a secondary market for the spectrum. The Commission could also choose to apply rules typically used in terrestrial wireless proceedings, such as buildout requirements, to promote spectrum utilization and prevent warehousing, as well as anti-concentration rules to ensure the repurposing of spectrum increases competition.

2. *Transaction approvals.* As noted by IB and OGC, Harbinger has several pending proceedings at the Commission. Presumably, the motivation behind Harbinger's bids for control of both Skyterra and Inmarsat is a desire to rationalize the bandplan for the L-Band spectrum occupied by those two companies. (Full rationalization of the band would also require consent from the Mexican and Russian governments) To the extent that a rationalized band plan allows for deployment of new technology (e.g., by enabling wider channel widths) these transactions may support goals of promoting broadband described above. Looked at another way, the transaction approvals potentially provide the Commission with leverage to ensure that Harbinger comes up with a plan to fund and deploy mobile broadband service using the L-Band spectrum.

3. *National Broadband Plan.* The National Broadband Plan itself provides an opportunity to articulate a larger goal that transcends the narrower disputes over ATC and other issues that have limited development of the band thus far. Similarly, the Plan provides an opportunity to examine the role of satellite broadband service in the context of the full broadband marketplace.

# Exhibit 4

**Juliana Villalta**

**From:** Robert Nelson
**Sent:** Monday, November 29, 2010 7:33 AM
**To:** Karl Kensinger
**Subject:** FW: LightSquared Comment Period Extension Order
**Attachments:** DA-10-2243A1[LightSquared Extension].doc

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**From:** Gardner Foster
**Sent:** Friday, November 26, 2010 1:25 PM
**To:** Austin Schlick; Ruth Milkman; Roderick Porter; Mindel DeLaTorre; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus
**Subject:** LightSquared Comment Period Extension Order

The item has been released. We are sending a PDF version to CTIA and LightSquared separately.

---

**From:** Austin Schlick
**Sent:** Wednesday, November 24, 2010 2:24 PM
**To:** Gardner Foster; Ruth Milkman; Roderick Porter; Mindel DeLaTorre; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus
**Subject:** RE: DRAFT LightSquared Comment Period Extension Order

Typo suggestions.

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**From:** Gardner Foster
**Sent:** Wednesday, November 24, 2010 2:18 PM
**To:** Ruth Milkman; Roderick Porter; Mindel DeLaTorre; Austin Schlick; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus
**Subject:** DRAFT LightSquared Comment Period Extension Order
**Importance:** High

All,

Please find attached a draft Order extending the relevant deadlines by 3 days. If everyone agrees with form and substance, IB will release Friday Morning.

Thanks
Gardner

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**From:** Ruth Milkman
**Sent:** Wednesday, November 24, 2010 1:34 PM
**To:** Roderick Porter; Mindel DeLaTorre; Austin Schlick; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster
**Subject:** Re: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

Rod -- just forwarded. Note also that they copied Jeff Carlisle when filing.

---

**From**: Roderick Porter
**To**: Ruth Milkman; Mindel DeLaTorre; Austin Schlick; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster
**Sent**: Wed Nov 24 13:12:59 2010

**Subject:** RE: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

I will call LS. Also, we will draft the extension once it is filed. If it has been filed already, please forward.

Rod.

---

**From:** Ruth Milkman
**Sent:** Wednesday, November 24, 2010 12:43 PM
**To:** Mindel DeLaTorre; Roderick Porter; Austin Schlick; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster
**Subject:** RE: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

it's a fair worry. but I guess on balance I'd still go with 3 days.

Who will call LS to explain the plan, and say we don't think it will significantly affect our ability to put out an order in the timeframe discussed previously?

And is there anyone in IB available to draft an extension order, which will need to be put out friday at the latest (or could go out today)? I think paul murray is in the office today; jeremy is out.

---

**From:** Mindel DeLaTorre
**Sent:** Wednesday, November 24, 2010 12:39 PM
**To:** Ruth Milkman; Roderick Porter; Austin Schlick; Paul de Sa; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster
**Subject:** RE: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

I guess the worry is that we are opening ourselves up unnecessarily for more negative comments, appeals, etc. from the mobile community when we don't really need to. But really, if you're fine with it then we will go with the flow -- as you point out, it is your resources here! We're just worried that there is already a perception that we're ramming this through (again) on behalf of LS and we were trying to save us from more criticism...:)

Happy Thanksgiving...Mindel

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**From:** Ruth Milkman
**Sent:** Wednesday, November 24, 2010 12:34 PM
**To:** Roderick Porter; Austin Schlick; Paul de Sa; Mindel DeLaTorre; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster
**Subject:** Re: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

Rod -- the schedule is so tight on drafting the waiver (which is being staffed by WTB folk) that I am really concerned that we jeopardize our ability to get something out the week of Dec 20. I don't think we have to justify it -- we just say that in light of the Thanksgiving holiday, we are giving 3 additional days (which seems fair, given that most people get 2 business days, Thurs and Fri off).

---

**From**: Roderick Porter
**To**: Austin Schlick; Ruth Milkman; Paul de Sa; Mindel DeLaTorre; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster
**Sent**: Wed Nov 24 12:11:38 2010
**Subject**: RE: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

Reworded the last sentence to make sure there is no misunderstanding about what I am proposing.

---

**From:** Roderick Porter
**Sent:** Wednesday, November 24, 2010 12:06 PM
**To:** Austin Schlick; Ruth Milkman; Paul de Sa; Mindel DeLaTorre; Paul Murray; Robert Nelson; John Leibovitz; Jeremy Marcus; Gardner Foster

**Subject:** RE: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

We would propose to give the full week (7 day) extension requested. I believe this would result in only two additional business days from Ruth's proposal. It is simply not worth it to try to justify why not giving them an additional 2 business days (beyond Ruth's proposal) is appropriate and why the December 20th date is so critical.

---

**From:** Austin Schlick
**Sent:** Wednesday, November 24, 2010 11:46 AM
**To:** Ruth Milkman; Paul de Sa; Mindel DeLaTorre; Paul Murray; Robert Nelson; Roderick Porter; John Leibovitz; Jeremy Marcus
**Subject:** RE: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

3 days would be a very reasonable response; given my understanding of your conversations with the wireless cos, LS might possibly be persuaded that a short extension of this sort is in their overall interest.

---

**From:** Ruth Milkman
**Sent:** Wednesday, November 24, 2010 11:38 AM
**To:** Paul de Sa; Mindel DeLaTorre; Paul Murray; Robert Nelson; Roderick Porter; John Leibovitz; Austin Schlick; Jeremy Marcus
**Subject:** Fw: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

Fyi. Options might be: (1) to give a short extension, eg 3 days and also extend replies by 3 days. (2) deny extension.

Any extension is going to make it tough to do an order Dec 20.

Do we also need to give a heads up to LS?

---

**From**: Brian Josef [redacted]
**To**: Ruth Milkman
**Cc**: Matthew Nodine; Christopher Guttman-McCabe [redacted]
**Sent**: Wed Nov 24 10:42:43 2010
**Subject**: LightSquared Subsidiary LLC Modification Application - SAT-MOD-20101118-00239

Ruth:

I know that you spoke with Chris regarding the recent Lightsquared modification application. After speaking with members, and in light of the expedited filing period over the holiday week, we plan to file today a request for a one week extension. Please let us know if you have any questions.

Thanks and have a relaxing Thanksgiving holiday!

Regards,

Brian

**Brian M. Josef**
*Director, Regulatory Affairs*
**CTIA**-The Wireless Association®
*Expanding the Wireless Frontier*

[redacted]

# Exhibit 5

Federal Communications Commission
Washington, DC 20554

**TO:** Chairman Julius Genachowski
Priya Aiyar

**CC:** Austin Schlick
Paul De Sa

**FROM:** Jim Bird
John Giusti
John Leibovitz

**SUBJECT:** Satellite Service - Harbinger

**DATE:** September 2, 2009

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**Introduction**

Harbinger is a private equity investor with substantial, but ostensibly non-controlling, interests in a majority of the companies with authorizations in bands of spectrum designated for providing Mobile Satellite Service (MSS). In August of 2008 Harbinger filed an application asking the FCC to approve a series of transactions that would give Harbinger control of two of the companies in which it already had significant investments—Skyterra and Inmarsat. These two companies are the only companies currently authorized to provide service in one of the MSS bands (the "L Band").

The applications promised substantial public interest benefits from the combination of the two companies under Harbinger's control—primarily flowing from the creation of a nationwide, integrated MSS/Ancillary Terrestrial Component ("ATC") service. This service would provide broadband voice and data communications that would be particularly beneficial in rural and remote areas and in situations where natural disasters or emergencies impaired other alternatives. The proposed transactions would allow Harbinger to create this service by combining and integrating the authorizations of the two companies and taking full advantage of their ATC potential. In addition, the combination would produce economies of scale that would assist in attracting equipment suppliers, for example for cell-phone like handsets, which would make the service more attractive and competitive.

The application for control of Inmarsat involved procedural problems (discussed below) which resulted in Harbinger's separately seeking approval for control of SkyTerra. IB put that application out for public comment on May 1 of this year. The Inmarsat portion has not been accepted for filing.

The proposed creation of a nationwide integrated satellite/terrestrial broadband service with special benefit for rural areas and public safety and first responders has understandably drawn the attention of the Commission. This memorandum addresses the various issues raised by the Harbinger applications in order to focus on what decisions need to be made and what alternative actions are available to best advance the public interest.

We begin with a background description of the spectrum resources committed to MSS and their current status. This section provides an initial basis for considering the resources currently available (both spectrum and companies), and some of the difficulties and possibilities faced by the industry and the FCC in putting them to use.

We then address the current applications, the specific processing issues they raise, the progress toward resolving them, and potential paths forward. The issues include (1) what may be done to make the Inmarsat application acceptable for filing, (2) what substantive issues are raised by the combination of SkyTerra and Inmarsat (potential harms and benefits), (3) what level of analysis is necessary before the Commission can act on the SkyTerra application and what impact would this have on the timing of Commission action, and (4) potential objections that are likely to be raised by terrestrial licensees who purchased their licenses at auction to the provision of a competing service using authorizations that were granted without an auction or payment.

Finally, we consider alternative ways the Commission might tailor its action on the applications to best achieve its public interest goals.

## I. BACKGROUND

### A. Mobile Satellite Industry

#### 1. Spectrum

Currently, several frequency bands are allocated to the MSS: the L-Band, the 2 GHz Band, the Big Leo Band and the Little LEO Band. The table below notes each of these bands, frequency allocations to MSS and the current licensees. In section 2, we review each of these frequency bands and provide a brief history of the operations in each band.

**Overview of MSS Industry**

| Common Name of Frequency Band | Frequencies | Current Licensees |
|---|---|---|
| L-Band | 1525-1559 MHz (downlink)<br>1626.5-1660.5 MHz (uplink) | Inmarsat<br>SkyTerra |
| 2 GHz MSS | 2000-2020 MHz (uplink)<br>2180-2200 MHz (downlink) | DBSD<br>TerreStar |
| Big LEO | 1610-1626.5 MHz (uplink)<br>2483.5-2500 MHz (downlink)<br>[Iridium, a TDMA system, is bi-directional in lower band] | Globalstar<br>Iridium |
| Little LEO | 137-138 MHz (downlink)<br>148-149.9 MHz (uplink)<br>400.15-401 MHz (downlink) | None |

#### 2. L-Band

The L-band is composed of the 1525-1559 MHz and 1626.5-1660.5 MHz bands. Inmarsat and SkyTerra are the two L-band satellite operators currently providing service in the United States.

##### a) Inmarsat

The International Maritime Satellite Organization ("Inmarsat") was an inter-governmental organization created in 1978 to develop a global maritime satellite system to meet commercial

maritime and safety communications needs of the United States and foreign countries. In the United States, Inmarsat space segment has been used primarily for the provision of maritime mobile satellite service (MMSS). Much of the MMSS use has been concentrated in the lower L-band. In limited instances, the Commission has also authorized use of Inmarsat space segment for the provision of domestic MSS, including land mobile satellite service, to address emergency or other short-term communications needs.[1] The Commission has also authorized certain aeronautical mobile uses.[2]

Inmarsat became privatized on April 15, 1999 and currently has 13 satellites.

**b) SkyTerra**

In 1989, the Commission granted SkyTerra's predecessor, AMSC Subsidiary Corporation ("AMSC"), authority to construct, launch, and operate a three-satellite geostationary-satellite MSS system to operate in 28 megahertz (14 megahertz in each transmission direction) of L-band spectrum.[3] AMSC was authorized to operate in the "upper" portion of the L-band only, the 1545-1559 MHz and 1646.5-1660.5 MHz bands, subject to international coordination. AMSC also sought authority to operate in the lower L-band, and currently operates some METs in the lower L-band pursuant to a grant of temporary authority.[4]

In 2001, AMSC changed its named to Motient Services, Inc. ("Motient").[5] Subsequently, in 2006, Motient transferred control of its satellite license from its subsidiary, MSV, to SkyTerra.[6] SkyTerra currently operates one satellite, AMSC-1, at 101° W.L.

**c) The L-Band Coordination Agreement**

In North America and nearby international airspace and maritime areas, five satellite operators provide service in the L-band's 66 megahertz MSS allocation.[7] Under the Radio Regulations of the International Telecommunication Union (ITU), operators of satellite systems are required to coordinate their spectrum use to prevent interference to, and receive protection from, other

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[1] *See, e.g., American Mobile Satellite Corporation, et al.*, 7 FCC Rcd 942 (1992).

[2] In October 1989, amendments to the Inmarsat Convention and Operating Agreement allowed the organization to provide aeronautical services in addition to maritime services. *See also* Provision of Aeronautical Services via the Inmarsat System, *Report and Order and Authorization*, CC Docket No. 87-75, 13 FCC Rcd 21155 (1998).

[3] Amendment of Parts 2, 22, and 25 of the Commission's Rules to Allocate Spectrum for and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service, *Memorandum Opinion Order and Authorization*, 4 FCC Rcd 6041 (1989); *remanded*, Aeronautical Radio, Inc. v. FCC, 928 F.2d 428 (D.C. Cir. 1991); 7 FCC Rcd 266 (1992); *aff'd sub nom.* Aeronautical Radio, Inc. v. FCC, 983 F.2d 275 (D.C. Cir. 1993).

[4] *AMSC Subsidiary Corporation*, 10 FCC Rcd 10458 (1995) (authorizing AMSC to operate its existing data mobile terminals in the lower L-band on a temporary basis).

[5] *See Comsat Order*, 16 FCC Rcd at 21669-70 (para. 4).

[6] Motient Corporation and Subsidiaries, Transferors, and SkyTerra Communications, Inc., Transferee, Application for Authority to Transfer Control of Mobile Satellite Ventures Subsidiary LLC, *Memorandum Opinion and Order and Declaratory Ruling*, WC Docket No. 06-106, 21 FCC Rcd 10198 (Int'l Bur., WCB, and OET, 2006).

[7] The five operators are: Motient (now SkyTerra); MSAT (now SkyTerra Canada), a Canadian operator; Solidaridad, a Mexican-licensed operator; TM Sat, a Russian operator; and Inmarsat Ltd., a United Kingdom operator.

systems.[8] International coordination of the L-band frequencies has been difficult because the stated requirements of the five systems involved in the coordination far exceed the 66 megahertz of spectrum available.

In June 1996, after seven years of negotiations, the operators recognized that they would not be able to reach a long-term coordination agreement that would accommodate their business plans. As a result, the United States, Canada, Mexico, Russia and Inmarsat[9] developed and agreed upon a unique framework that was intended to facilitate annual spectrum assignment agreements among the operators.[10] Pursuant to this agreement, often referred to as the Mexico City Agreement, the operators signed an arrangement based upon current and projected traffic levels of each system, to be revisited annually. Each operator's spectrum assignments consisted of small non-contiguous frequency assignments spread throughout the band. Unlike most international coordinations that create permanent assignments of specific spectrum, the operators' assignments can change from year to year based on their marketplace needs. However, the parties to the Mexico City Agreement did not review or renegotiate their spectrum assignments from 2000 to 2007.

On December 21, 2007, Inmarsat and MSV (now SkyTerra) signed a "Spectrum Coordination and Cooperation Agreement" aimed at resolving outstanding differences between the parties regarding use of the L-band.[11] The agreement envisions a phased multi-year implementation. On March 26, 2008, the Commission reached government-to-government satellite coordination agreements with the United Kingdom and Canada.

Currently, the United States is in the process of coordinating SkyTerra's next generation satellite system with Canada, Mexico and the United Kingdom.

### 3. 2 GHz Band

The Commission adopted MSS rules for the 2 GHz bands in 2000.[12] In 2001, the International Bureau (Bureau) authorized eight satellite operators to provide MSS in the 2 GHz bands. By the end of 2004, three of those satellite operators had their licenses cancelled for failure to meet milestone obligations.[13] In early 2005, three 2 GHz MSS satellite operators, Iridium, Boeing, and Celsat, surrendered their authorizations.[14] This left only two satellite operators, ICO (now DBSD) and Terrestar (then known as TMI), with spectrum to provide MSS in the 2 GHz band.

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[8] *See generally* International Telecommunication Union's Radio Regulations Article S9 (1998 edition).

[9] The United Kingdom later informed the Commission that it is a party to the Mexico City Agreement. *See* Letter from Steve Jones, United Kingdom Radiocommunications Agency, to Thomas S. Tycz, Federal Communications Commission, dated August 18, 1999.

[10] *See* International Action: "FCC Hails Historic Agreement on International Satellite Coordination," News Release, Report No. IN 96-16 (June 25, 1996).

[11] Press Release, "SkyTerra, Mobile Satellite Ventures and Inmarsat Sign Spectrum Coordination and Cooperation Agreement," December 21, 2007, available online at http://www.msvlp.com/media/press-releases-view.cfm?id=158&yr=2007.

[12] Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band, *Report and Order,* IB Docket No. 99-281, 15 FCC Rcd 16127, 16128 (para. 1) (2000).

[13] The three licensees were Mobile Communications Holdings, Inc. (MCHI), Constellation Communications Holdings, Inc. (Constellation),and Globalstar.

[14] Specifically, Iridium LLC (Iridium) surrendered its authorization on March 16, 2005, the Boeing Company (Boeing) on March 28, 2005, and Celsat America, Inc. (Celsat) on April 12, 2005.

In December 2005, the Commission adopted an Order reassigning the spectrum formerly assigned to Iridium, Boeing, and Celsat to ICO and Terrestar. As a result, ICO (DBSD) and Terrestar each have 20 megahertz of spectrum in the 2 GHz bands.[15]

**4. Big LEO**

The Big LEO bands are the 1610-1626.5 MHz band and the 2483.5-2500 MHz band. The Commission adopted MSS service rules for the Big LEO bands in 1994.[16] At that time, five parties were seeking licenses in these bands. One party proposed to use a different method for preventing transmissions within its satellite network from causing interference to each other. Specifically, one party proposed Time Division Multiple Access (TDMA), and the other four proposed Code Division Multiple Access (CDMA).[17] At the time, the Commission determined that the four CDMA operators could share spectrum with each other, but that their systems would not be compatible with the TDMA system.[18] Consequently, the Commission adopted a band plan for Big LEO systems that designated the 1621.35-1626.5 MHz band for TDMA operations. The Commission also designated the 1610-1621.35 MHz and the 2483.5-2500 MHz bands for shared CDMA operations.[19] At that time, the Commission considered the possibility that not all of the proposed CDMA systems would ultimately be built and launched, and pledged to revisit its spectrum assignments in the event that only one CDMA system were launched.[20]

Currently, Iridium and Globalstar are the only licensees in these frequency bands. Globalstar operates a CDMA system, and Iridium operates a TDMA system. In October 2008, the Commission adopted an Order modifying Iridium's and Globalstar's licenses to be consistent with earlier revisions that it made in the Big LEO frequency band assignments.[21] Specifically, the Commission moved some spectrum from Globalstar to Iridium.

Globalstar is now authorized to operate its space stations in the 1610-1617.775 MHz frequency band on an exclusive basis, and Iridium is authorized to operate its space stations in the 1618.725-1626.5 MHz band on an exclusive basis. Globalstar and Iridium are required to share the frequency band located between their two exclusive use frequency band assignments, or in other words, the 1617.775-1618.725 MHz frequency band. Globalstar also has authority to operate in the 2483.5-2500 MHz frequency band.

**5. Little LEO**

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[15] *See* Use of Returned Spectrum in the 2 GHz Mobile Satellite Service Frequency Bands, *Order*, IB Docket Nos. 05-220 and 05-221, 20 FCC Rcd 19696 (2005) (*2 GHz MSS Spectrum Assignment Order*), *recon. pending.*

[16] *See* Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, *Report and Order*, 9 FCC Rcd 5936 (1994) (*1994 Big LEO Order*), *recon.*, *Memorandum Opinion and Order*, 11 FCC Rcd 12861 (1996).

[17] The TDMA technique assigns each remote earth station a different time to transmit and receive information. CDMA prevents interference between remote earth stations by assigning a different digital code to different earth stations. For a more detailed discussion of TDMA and CDMA, see 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 15 FCC Rcd 25128, 25206-10 (App. E) (2000).

[18] *1994 Big LEO Order*, 9 FCC Rcd at 5954 (para. 43).

[19] *Id.* at 5955 (para. 44).

[20] *Id.* at 5959-60 (paras. 54-55).

[21] Globalstar Licensee, LLC, *Order of Modifications*, 23 FCC Rcd 15207 (2008).

The little LEO bands are the 137-138 MHz and 400.15-401 MHz bands. Originally, three satellite system licenses were issued for these bands, but all three licensees have since lost or surrendered their licenses.[22]

### 6. Ancillary Terrestrial Component (ATC)

To allow MSS users to enjoy ubiquitous coverage in the United States, the Commission issued rules in February 2003 that allowed MSS operators to construct and operate ATCs – terrestrial networks operating in spectrum assigned for the licensee's MSS operation – to augment service in areas where the satellite signal is attenuated or unavailable. The ATC rules require that operators meet certain "gating" criteria, which are designed to prevent ATC from becoming a stand-alone terrestrial service. The gating criteria require MSS operators to: (1) provide substantial satellite service; (2) maintain spare satellites; and (3) integrate MSS and ATC services.

The Commission has issued ATC authorizations to SkyTerra in the L-Band, Globalstar in the Big LEO band and DBSD in the 2 GHz band. In addition, TerreStar has a pending application for authority to provide ATC in the 2 GHz band. No ATC stations are commercially operating. The following is a brief description of the status of the current ATC authorizations:

SkyTerra: SkyTerra has filed an application to modify its ATC authorization, in which it requests waivers of technical rules consistent with a coordination agreement with Inmarsat. Over time, SkyTerra has requested several technical modifications to its ATC authority in order to provide flexibility to pursue a wide range of business plans for interconnected voice and data services, while also providing for continuity from its current generation system. Amtech Systems LLC and Skywave Mobile Communications, which have licenses for operation of mobile earth stations using SkyTerra or Inmarsat satellites, have filed petitions to deny the application, arguing that grant of the requested waivers would result in interfere to their mobile earth stations from SkyTerra ATC operations. We note that SkyTerra resolved through negotiations an issue raised by the U.S. GPS Industry Council concerning limits on out-of-band emissions to protect satellite radionavigation.

Globalstar: In May 2008, Globalstar filed an application to modify its ATC authorization to permit another party, Open Range, to lease Globalstar's assigned spectrum to provide ATC service to rural customers equipped with terminals using the WiMAX protocol, consistent with a $267 million loan commitment from the USDA Rural Development Program.

In October 2008, the Commission granted interim waivers of certain ATC gating criteria and technical rules to permit Open Range to provide the proposed ATC service. CTIA filed a Petition for Reconsideration, arguing that, among other things, the waivers undermine the purpose of the gating requirements. On the same date, Iridium filed a petition for judicial review of the order, arguing that the grant was arbitrary and capricious. In January 2009, the court granted the Commission's request to hold Iridium's petition in abeyance pending Commission disposition of CTIA's petition for reconsideration.

DBSD: Sprint Nextel has filed an application for review of the International Bureau's grant of ATC authority to DBSD, arguing that the ATC rules require that all coverage and gating criteria be met prior to grant of authority. DBSD's business plan focuses on provision of mobile video and data, including delivery to cars. We note that the 2 GHz frequency bands are the subject of an ongoing OET proceeding related to reimbursement for relocation of incumbent Broadcast Auxiliary Service operations.

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[22] *See* Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile Satellite Service, *Report and Order*, CC Docket No. 92-76, 8 FCC Rcd 8450 (1993).

[A summary of the current status of MSS—problems and possibilities—might be useful here as a set up for Harbinger's proposal, which purports to address what it alleges are currently impediments to the highest and best use of these assets]

### B. Harbinger

#### 1. General Background on Harbinger

Harbinger is an investment fund, founded by Phil Falcone in 2001. Mr. Falcone is a graduate of Harvard University, and held positions at Kidder Peabody, Wachovia and Barclays with a focus on the junk bond market. A former college and professional hockey player, Mr. Falcone also holds a minority interest in the National Hockey League (NHL) team the Minnesota Wild. Harbinger now manages two funds totaling $18 billion. In 2007, these two funds earned 114% and 176% returns. In addition to the two transactions pending before the Commission, Harbinger has acquired interests in other MSS companies and communications companies.

**Harbinger Ownership Interests**

| Company | Service (Frequency Band) | Level of ownership interest as of March 27, 2009 |
|---|---|---|
| Inmarsat | MSS (L-Band) | 29% of voting shares and convertible bonds |
| DBSD (formerly ICO) | MSS (2 GHz) | $99.5 million in convertible bonds in ICO North America and about 2.4 million common shares in ICO Global |
| Terrestar | MSS (2 GHz) | 31% of voting shares and 44% of equity |
| SkyTerra | MSS (L-Band) | 49% of voting shares, 62% of equity, and right to acquire additional voting shares out of escrow* |
| SatMex | FSS (C-band and Ku-band) | 10 to 25% |
| Leap Wireless | Fixed Service | 10 to 25% |
| New York Times | Newspaper, Radio** | 10 to 25% |

* Terrestar had 28% of the equity in SkyTerra, but sold its interest as of Sept. 16, 2008. Harbinger bought some of that interest. It is now held in escrow pending Commission approval of the transfer to Harbinger.
** According to Wikipedia, on July 14, 2009, the New York Times announced plans to sell its radio station to Univision.

#### 2. Pending Harbinger Proceedings

On August 22, 2008, Harbinger filed interrelated applications seeking authority for:

(1) the transfer of control of SkyTerra to Harbinger;
(2) the transfer of control of Inmarsat's U.S. holdings to Harbinger; and
(3) a declaratory ruling that it would be in the public interest within the meaning of Section 310(b)(4) of the Communications Act for Harbinger and any commonly-controlled funds to own, directly or indirectly, up to 100% of the issued and outstanding stock of SkyTerra.

Harbinger contemplates that, once the Commission approves its acquisition of SkyTerra, the combined Harbinger/SkyTerra entity would then seek control of Inmarsat pursuant to U.K. law. On March 4, 2009, Harbinger made a filing to bifurcate the interrelated transfer of control applications so that the Commission could act first on the SkyTerra transaction. A more complete discussion of the two proceedings follows.

## II. Analysis of Two Pending Items.

### A. Inmarsat

1. *Procedural Concerns.* On August 22, 2008, Harbinger filed an application requesting Commission consent for the transfer of control of licenses and authorizations relating to the acquisition of stock of each of SkyTerra (up to 81.5%) and Inmarsat (up to 100%) that it does not already own. Due to staff concerns relating to the Inmarsat portion of the application, Harbinger severed the Inmarsat portion of the application from the SkyTerra portion, the latter being placed on Public Notice on May 1, 2009. The Inmarsat application has yet to be placed on public notice.

After the acquisition of SkyTerra, Harbinger proposes to use SkyTerra to acquire up to all of the outstanding stock of Inmarsat, a U.K. public limited company, which it does not already own (70%) by means of a tender offer regulated by the U.K.'s City Code on Takeovers and Mergers (the "Code"), which is overseen by the Panel on Takeovers and Mergers (the "Panel"). Harbinger has submitted its application under its own signature but without the Commission-required signature of the target company. Accordingly, in its application, Harbinger has requested a waiver of the Commission rule that would require Inmarsat to sign the application.

The Panel authorized Harbinger to announce its potential tender offer by means of a little used form of announcement, known as a "possible offer." The announcement merely says that Harbinger may make an offer for Inmarsat at some point in the future and at some, as yet undetermined, price. The lack of specificity with the possible offer causes certain problems in connection with the Commission's review process, and is in apparent conflict with both the process and the policies set out in the Commission's Tender Offer Policy. First, Inmarsat cannot evaluate the transaction and make a recommendation to its shareholders as no price is stated. Accordingly, Inmarsat, a principal party, will not be able to effectively participate in the Commission's process as it will not know whether it is for or against the transaction. Second, other parties that may be interested in bidding for Inmarsat are effectively shut out of the process as they too will not know whether the amount that Harbinger may be prepared to pay is a fair price for the company. If the Commission were to approve Harbinger's application as submitted, Harbinger would have a significant advantage over competing alternatives when at last it announces the terms of its offer. Third, by not stating a price, Harbinger is effectively asking the Commission to consent to a nonexistent transaction, and give an advisory opinion (which is something the Commission has always been reluctant to do, both because it would waste Commission resources and because it would violate the "level playing field" policy). Harbinger has been advised of the Commission's reluctance to process an application on this basis and has recently undertaken to consider alternatives that would address the Commission's concerns

Research into the Code and discussions with the Panel lead staff to believe that there is at least one, and probably more than one, alternative that would meet the concerns identified by the staff and enable Harbinger to proceed with a tender offer for Inmarsat—i.e., Harbinger would have to fix a firm price for Inmarsat thereby enabling Inmarsat and other parties to participate in the proceeding and avoiding an advisory opinion.[23]:

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[23] For example, Tender Offers under the Code must normally be completed within 109 days. This would generally be insufficient to allow for the Commission approval process to be completed. Accordingly, the Code provides for use of a "contingent offer." This requires that Harbinger fix a price for Inmarsat at the outset but would enable it not to proceed with the transaction if the Commission did not give consent to the transaction or if the transaction proved impossible to finance. Alternatively, it may be possible to use a variation on the Commission's own Tender Offer Policy. The Panel will not allow an offer to go forward that places shares, per the Commission's policy, with a trustee during the pendency of the Commission's review period. However, if the Commission were to allow the shares to be held directly by Harbinger

2. *Public Interest analysis.* On the merits, whether the acquisition of Inmarsat by SkyTerra will be in the public interest will depend in part on a competition analysis that examines the markets in which each of the two participates and the potential impact of the combination on competition in those markets and in part on what concrete public interest benefits the transaction will produce. Ultimately, once compliance with its rules is assured, the Commission determines whether, on balance, the potential benefits outweigh the potential harms. The balance may be adjusted by adding conditions to an approval to minimize potential harms or provide additional benefits (historically, there has been some controversy, and not always consistent action, over whether the benefits must be directly related to ameliorating merger-specific harms).

*a. Public Interest harms.* Given the concentration of ownership of MSS providers (see above), the impact of these transactions on competition will depend on whether the MSS service is, in fact, a separate market or whether it is part of a broader market of MSS/FSS providers. This issue will be presented most starkly in the application by SkyTerra to acquire control of Inmarsat's licenses. That transaction will combine the only two operators currently licensed to provide service in the L-Band, and the new owner will also have substantial interests in most of the other providers of MSS. The economists within IB believe that the Commission's current data base is not sufficient to analyze the economic impact of a transaction with potential to concentrate so much control over MSS spectrum assets. The necessary data could be acquired by information requests to the applicants and others. Acquisition and analysis would take some time to accomplish. In this connection, we note several points: (1) the Department of Justice has already allowed a Hart Scott Rodino filing for the entire transaction to pass without issuing a second request (a new HSR filing, that will be examined by a new administration, will be required, however, after this month). (2) The Commission currently has pending a petition for reconsideration of an IB decision granting Inmarsat's application to acquire Stratos (its largest distributor), which argues that the bureau acted without sufficient record information on the markets involved. IB (and OGC) concluded that the available market data was sufficient to resolve the vertical combination issues in that case. (3) The Commission will be issuing an annual report on the state of competition in the satellite industry by the end of the year.

*b. Public Interest Benefits.* Harbinger alleges that the combination of SkyTerra and Inmarsat under its control will enhance and accelerate the creation of an integrated MSS-ATC network that will provide new and seamless wireless communications services particularly suitable for public safety, homeland security organizations first responders and those in rural areas. It will allow for communications to and from the public switched telephone network while also providing Internet connections anywhere on the continent. The Commission will have to examine Harbinger's claims to determine, among other things, whether such benefits could be achieved by alternative means that would avoid potential harms, how certain the alleged benefits are to occur, and how Harbinger's plans would square with the policies of the Communications Act (e.g., they might promote widespread availability of advanced services; they might also raise questions of fairness given the controversial nature of ATC and the differences in how terrestrial and satellite spectrum is made available for use). Conditions on an approval may address several of these issues.

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under a Special Temporary Authority, and pursuant to an agreement not to exercise control and to divest if the Commission were to issue an adverse decision it may be possible for Harbinger to use the "firm offer" approach that is the normal method of making a tender offer in the United Kingdom.

*c. Role of Private Equity.* These applications provide an opportunity for the Commission to observe and consider the role played by private equity funds in the satellite industry. In an industry where there is high risk (which arguably justifies the possibility of higher than normal returns) and the need for substantial initial capital, private equity can play a useful role. Harbinger presents itself as willing to take a bold step to break barriers that have thus far prevented the development of valuable services. On the other hand, such funds are in business to make above market returns, and there have been complaints in recent years that some private equity investments have done so by replacing equity with debt, thus extracting capital and making satellite providers more vulnerable in adverse economic conditions and less able to raise the large amounts of capital periodically required to renew their fleets. (Inmarsat's consistent income streams will probably assist Harbinger in arranging financing for its purchase). There is a balance here that the Commission can pay close attention to, and perhaps affect by conditions on approval.

**B. SkyTerra**

On May 1, 2009, the International Bureau placed Harbinger's application to acquire up to 81.5% of the outstanding stock of SkyTerra Communications, Inc. ("SkyTerra") on Public Notice. SkyTerra operates an MSS service in the L-Band and has the authority to operate ancillary terrestrial component ("ATC") facilities. Harbinger currently owns approximately 49% (voting) and 62% (equity)of SkyTerra along with warrants for additional shares. Notwithstanding the size of its holdings, Harbinger has disavowed the exercise of *de facto* control by agreeing not to elect any members of the board of directors.

The separate application relating to SkyTerra avoids the procedural hurdle posed by the application to acquire Inmarsat, and deletes the presentation on public interest benefits that would be gained by combining the two L-band operators. The main issue with respect to SkyTerra's application is the level of analysis that will be required at this stage of what is expected to be a two-stage transaction.

- Although the MSS market definition and potential concentration issues are presented most starkly in the application by SkyTerra to acquire control of Inmarsat's licenses, theyare also relevant to Harbinger's acquisition of control of SkyTerra. Harbinger already owns nearly 30% of Inmarsat, originally applied for both transactions simultaneously, and has indicated that the acquisition of Inmarsat is a critical aspect of its business plan.

- Since none of Harbinger's current interests in other MSS providers amount to control, and since there are no specific rules governing or limiting attributable interests as in some other areas of FCC jurisdiction, it may disputed whether Harbinger's 30% interest in Inmarsat (or any of its other interests in MSS spectrum) requires a robust market analysis in the SkyTerra proceeding. After all, Harbinger has been able to acquire all its current interests, including 49% of SkyTerra and nearly 30 % of Inmarsat, without any such analysis. Nevertheless, Harbinger will for the first time be acquiring actual control, as opposed to an ownership interest.

- DOJ has recently allowed time to expire on a separate HSR filing with respect to SkyTerra, although staff expressed some interest in the extensive investments of Harbinger in the MSS area. DOJ's possible reasons for not pursuing a second request (small impact of a nascent business) are not necessarily persuasive to the FCC, as the agency responsible for assuring that spectrum is allocated in a way that protects competition even in markets that are nascent, from developments that may be hard to reverse later.

- In terms of Commission precedent, there are cases in which the Commission has declined to consider other pending applications when acting on the one immediately before it, on the

ground that any cumulative impacts will be addressed when it considers the later applications. On the other hand, in some cases, the Commission has considered separate applications that would have a profound impact on relevant markets essentially simultaneously (e.g., SBC/ATT and Verizon/MCI). The existing 30% ownership here would provide additional justification for considering the impacts of both proposed transactions, although the economic impact of a 30% ownership is, of course, less than control.

- Because the market analysis would presumably be necessary at the Inmarsat stage, and since Harbinger has complained about the existing and anticipated delay in acting on that application, we had thought that Harbinger would support beginning the market analysis sooner, rather than later. Unfortunately, Harbinger seems very anxious to have the Commission act on the SkyTerra application for reasons related to investor impatience, and may oppose any steps that would delay that proceeding, even at the expense of delaying action on the ultimate transaction.

- Ultimately, Harbinger may be convinced that a more fulsome analysis of the initial transaction is in its long-term interest, but this cannot be assumed at present.

# Exhibit 6

FEDERAL COMMUNICATIONS COMMISSION

# memorandum

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|---|---|
| **DATE:** | September 16, 2009 |
| **TO:** | Jonathan Baker, Chief Economist, FCC |
| **FROM:** | Mark Uretsky and Marilyn J. Simon[1]<br>Senior Economists, International Bureau |
| **SUBJECT:** | Preliminary Economic Review of Harbinger's Proposed Purchase of SkyTerra (Stage 1 of the Harbinger Transactions) |
| **CC:** | James Ball, Chief, Policy Division<br>Howard Griboff, Deputy Chief, Policy Division<br>Jerry Duvall, Chief Economist, IB |

**Introduction.** We have been asked to write a "competition section" for an Order addressing the proposed purchase of SkyTerra, a mobile satellite operator serving the United States and Canada,[2] by Harbinger, a private equity company with financial interests in various mobile satellite operators and terrestrial wireless carriers. In this memo, we review Harbinger's proposed purchase of SkyTerra for the purpose of evaluating the type and extent of economic analysis that will be necessary for review of the transaction.[3] The March 27, 2009 Narrative and other documents filed by Harbinger and SkyTerra (Applicants) contain little if any economic information useful for judging whether the transaction is in the public interest. Therefore, in this memo, we discuss the type of economic information that we believe is required for staff to undertake a substantive evaluation of the transaction from a competition standpoint. We also explain why a substantive review is warranted, without reaching conclusions about the merits of the transaction. Appendices A and B to the memo outline relevant economic information that the Commission could obtain. Appendix C is a chart depicting the ownership of major commercial

[1] The authors wish to thank Howard Griboff, Jennifer Balatan, Paul Locke, James Ball, and Jerry Duvall for their comments on the draft version of this memo.

[2] Mobile satellite operators own and operate satellites that provide telecommunications services for mobile applications, such as marine, aeronautical, and mobile land services. The satellites themselves may be geostationary or non-geostationary.

[3] *See SkyTerra Communications, Inc., Transferor, and Harbinger Capital Partners Funds, Transferee, Seek FCC Consent to Transfer Control of SkyTerra Subsidiary, LLC*, IB Docket No. 08-184, Public Notice, DA 09-996, 24 FCC Rcd 5226 (Int'l Bur. 2009) ("SkyTerra Public Notice").

mobile satellite operators[4] in the United States, and Appendix D is a chart summarizing basic data about these operators and the bands in which they operate.

**Consolidation in the Mobile Satellite Industry.** There are currently five mobile satellite operators providing commercial service in the United States (Inmarsat, SkyTerra, Globalstar, Iridium, and Orbcom) as well as two mobile satellite operators who have launched satellites but are not yet providing commercial service (Terrestar and ICO). These companies operate in highly desirable portions of the radio spectrum[5] with a combined bandwidth of 144.9 MHz.[6] Inmarsat and SkyTerra share 68 MHz of spectrum in the L-band; Iridium and Globalstar share 33.0 MHz of spectrum in the Big LEO ("Low Earth Orbit") band; Orbcom has 3.05 MHz in the Little LEO band (with 0.85 MHz in the Little LEO band unassigned); and Terrestar and ICO share 40 MHz in the 2 GHz band. See Appendix D for a more detailed description of the spectrum bands and operators.

Harbinger's purchase of SkyTerra is the first stage of a two stage transaction. The second stage is a proposed hostile purchase of Inmarsat, the largest mobile satellite operator in the world, by SkyTerra. (By hostile purchase, we mean that Inmarsat has not signed an agreement to merge with Harbinger or SkyTerra.) Initially, the two stages were combined, but subsequently the Applicants separated the transaction into two stages, the first of which is procedurally less difficult. Stage 1 is <u>not</u>, however, less difficult with respect to economic review. As we explain below, Stage 1 by itself raises the issue of whether Harbinger could potentially harm the public interest through oligopolistic interaction between SkyTerra[7] and the various satellite and wireless operators in which Harbinger currently has substantial investments. Specifically, the Commission should consider whether Harbinger's ownership of SkyTerra would create a risk of competitive harm in relevant markets as a result of strengthened control over SkyTerra, combined

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[4] In addition to commercial mobile satellites, there are military mobile satellites. In this memo and its appendices, we discuss commercial mobile satellites only. As used in this memo, the term "mobile satellite" refers to "commercial mobile satellite."

[5] Mobile satellite spectrum is in the 1500 MHz – 2500 MHz range and has excellent radio propagation properties.

[6] See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, WT Docket No. 08-27 (Terminated), Thirteenth Report, DA 09-54, rel. Jan. 16, 2009, ¶¶ 69, 241-245, and Table 18, (Thirteenth CMRS Report). Note, however, that figures for Big and Little LEOs given in Table 18 of the Thirteenth CMRS Report are incorrect. The correct figure for Big LEO bandwidth is 33 MHz, not 45.7 MHz. The correct bandwidth for Little LEO is 3.9 MHz, not 4.0 MHz. Thus the correct figure for total MSS bandwidth is 144.9 MHz, not 157.7 MHz. *See Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands; Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems*; IB Docket No. 02-364 and ET Docket No. 00-258, Report and Order, Fourth Report and Order and Further Notice of Proposed Rulemaking, rel. July 16, 2004, FCC 04-134. *See also Applications by Orbcomm License Corp. For Authority to Modify its Non-Voice, Non-Geostationary Satellite System For Modification of System License to Extend the License TermFor Milestone Extension and Extension of Launch Authority For Special Temporary Authority*; File No. SAT-MOD-2007053 1-00076; File No. SAT-AMD-20071116-00161, Call Sign: S2103; File No. SAT-MOD-20070302-00041; File No. SAT-MOD-20020329-00246; File No. SAT-AMD-2002093 0-00247; File No. SAT-STA-20070919-00127, Order and Authorization, rel. March 21, 2008, DA 08-633.

[7] In addition to providing L-band service to the United States and Canada, SkyTerra is authorized by the FCC to provide ancillary terrestrial component (ATC) service (integrated satellite and terrestrial wireless service).

with Harbinger's present substantial financial interests in other mobile satellite and telecommunications companies.

Harbinger currently has 49.9 percent of the voting shares and 62 percent of the equity of SkyTerra. Harbinger also currently has a substantial interest in several of the other mobile satellite operators serving the United States. Harbinger owns approximately 29 percent of the voting shares of Inmarsat and has convertible bonds as well.[8] Harbinger also owns approximately 31 percent of the voting shares and 44 percent of the equity of TerreStar, a nascent mobile satellite operator that recently sent into space what has been described as "the largest-ever commercially launched satellite" to serve the United States and Canada in coordination with the AT&T wireless network.[9] After the purchase of SkyTerra, Harbinger would have additional interests in Terrestar, because SkyTerra currently owns 11 percent of TerreStar Networks, a subsidiary of TerreStar Corporation. Harbinger has other telecommunications interests, including equity interests of between ten and 25 percent of SatMex (Satelites Mexicanos Sa de CV) and Leap Wireless. Recent reports indicate that Harbinger has disposed of interests in ICO, which, like TerreStar, is a potentially important U.S.-licensed mobile satellite operator in an early phase of development.[10] See Appendix C for a detailed ownership chart of major mobile satellite operators in the United States.

In terms of spectrum allocation, the combination of SkyTerra and Inmarsat would give Harbinger full control of the L-Band, with 68 MHz of spectrum.[11] If we treat Terrestar as controlled by Harbinger, an additional 20 MHz in the 2 GHz band[12] would be under Harbinger's control. Thus Harbinger would command 88 MHz of a total 144.9 MHz currently allocated by the FCC for mobile satellite services. The Big and Little LEO satellites are optimized for voice and not broadband service, so Harbinger would control 88 MHz of 108 MHz of spectrum available for mobile satellite broadband services over the next few years.[13]

Thus Stage 1 initiates a major consolidation in the mobile satellite industry, in which Harbinger ultimately would fully own and control Inmarsat and SkyTerra as well as have financial interests in Terrestar and other mobile satellite operators and telecommunications companies. As described above, Harbinger is aiming to buy SkyTerra (Stage 1) and Inmarsat (Stage 2) outright; maintain a major, and perhaps controlling, interest in Terrestar. Whether such consolidation is likely to help or harm mobile satellite service (MSS) customers depends on facts about market definition,[14] supply and demand, and the financial stability of the mobile satellite services industry that we can only resolve through fact-finding and analysis. Even though Stage 1 limits Harbinger's control to SkyTerra, SkyTerra's incentive to compete with Inmarsat and

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[8] See March 27, 2009 Narrative at 8.

[9] See Wall Street Journal, July 1, 2009, page A-17 ("Va. Firm to Offer Pocket-Size Satellite Phone"). See also March 27, 2009 Narrative at 8.

[10] In Harbinger's March 27, 2009 Narrative, Harbinger stated that it had $99.5 million in convertible bonds in ICO North America & 2,398,281 common shares (less than 10%) in ICO Global.

[11] The L-Band includes uplinks at 1525 – 1559 MHz and downlinks at 1626.5 – 1660.5. See Appendix D.

[12] The 2 GHz band includes uplinks at 2000 – 2020 MHz and downlinks at 2180 – 2200 MHz. See Appendix D.

[13] Big and Little LEO bandwidth is 36.9 MHz and subtracting from 144.9 MHz leaves 108 MHz of bandwidth.

[14] It is not a given that mobile satellite services comprise a single market pursuant to *DOJ/FTC Horizontal Merger Guidelines*.

Terrestar would be substantially diminished as a result of Harbinger's interests in these companies. For this reason, it would be a mistake not to fully review Stage 1.

Stage 1 is also the "first bite of the apple." Should the Commission allow Harbinger to take the first bite, it will be harder for the FCC to make a finding that the second, incremental bite, could harm the public interest.

We recognize that Harbinger already has substantial financial interests in (and possibly *de facto* financial control over) in SkyTerra. Therefore, it might be argued, that the outright purchase of SkyTerra is an incremental change in ownership and does not necessitate a full review. We disagree. The purchase of SkyTerra by Harbinger will give Harbinger complete control over SkyTerra without what would otherwise be possibly countervailing fiduciary responsibilities to other owners. Thus we believe that a full review is warranted.

**Ancillary Terrestrial Component.** Another issue involves Harbinger's possible consolidation of ancillary terrestrial component (ATC) spectrum for use in hybrid satellite-terrestrial mobile services. In 2003, the FCC adopted a policy providing flexibility for delivery of communications services by mobile satellite service providers over spectrum previously authorized exclusively for satellite communications, termed ancillary terrestrial component.[15] Under the FCC policy, mobile satellite operators could use their spectrum to provide terrestrial service provided that such service is accessed over satellite-enabled handsets (*i.e.*, handsets able to communicate with a satellite should terrestrial service be unavailable).[16] Thus mobile satellite spectrum could be used for terrestrial service where it is economical to do so (through a new terrestrial network or in conjuction with an existing terrestrial network) and be used for satellite communication only where terrestrial service is unavailable. MSV (now SkyTerra), Globalstar, and ICO applied for and were granted ATC authorizations. Terrestar has a pending ATC application. Mobile satellite spectrum is highly valuable for terrestrial use because it is in the 1500 MHz – 2500 MHz range and has propagation properties that are ideal for terrestrial mobile service.[17] Moreover, the MSS spectrum licenses cover the entire United States. It is also unencumbered, except for the requirement that it remain available for some level of mobile satellite communications.

Through its acquisition of SkyTerra (in Stage 1) and Inmarsat (in Stage 2), Harbinger would have authority to provide ATC throughout the L-band,[18] encompassing a bandwidth of 68 MHz. Assuming that TerreStar receives ATC authorization and that Harbinger controls TerreStar, Harbinger would control 88 MHz of ATC-eligible spectrum, leaving Globalstar and ICO, the only other mobile satellite operators authorized to provide ATC, with 20 MHz each.[19]

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[15] *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands,* IB Dockets Nos. 01-185 and 02-364, Report and Order and Second Notice of Rulemaking, FCC 03-15, Feb. 10, 2003.

[16] Although calls are required to be originated over satellite-enable handsets, there is no requirement that they be transmitted to or from a satellite.

[17] Frequencies in the range 1-3 GHZ are considered to be ideal for terrestrial mobile service.

[18] SkyTerra has authorization to provide ATC anywhere it operates in the L-band, which it shares with Inmarsat. Although Inmarsat does not have authorization to provide ATC, presumably SkyTerra would have authority to provide ATC over the entire L-band spectrum once it acquires Inmarsat in Stage 2.

[19] For comparison purposes, approximately 274 MHz of terrestrial mobile wireless spectrum is currently in use, although the Commission identifies 643 MHz of spectrum as potentially available for terrestrial CMRS. *See Thirteenth CMRS Report*, Table 5. The 274 MHz is derived as follows: 50 MHz of spectrum in the cellular band; 14 MHz of spectrum in the SMR band; 120 MHz of spectrum in the broadband PCS

At present, Globalstar is planning to deploy an ATC network that will serve rural America with 20 MHz of spectrum.[20]

Based on various public reports, Harbinger's satellite companies will likely partner with a handset chipset manufacturer and CMRS (commercial mobile radio service) provider to provide mass-market satellite-terrestrial service over dual-mode handsets comparable in cost and size to current high-end cell phones.[21] Although public policy discussions of ATC technology usually focus on the prospect of providing service to rural America, the business case for ATC may be quite different. Harbinger may be planning use ATC to create a premium mobile broadband service for the mass market.[22]

Consolidation of ATC-eligible spectrum will commence with Stage 1: Harbinger, which already has major financial interests in SkyTerra, Inmarsat, and Terrestar, will buy SkyTerra outright. Stage 1 will also incrementally increase Harbinger's interests in Terrestar, as explained above. The next step in the consolidation will occur in Stage 2, in which SkyTerra purchases Inmarsat and consolidates Inmarsat's L-band spectrum. Of course, it is possible that post-Stage

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band; and 90 MHz of spectrum in some geographical locations in the AWS-1 band. An additional 115 MHz of spectrum should be available in the near future: 55 MHz of spectrum in the BRS band and 60 of 84 MHz of spectrum in the 700 MHz band. *See also Sprint Nextel Corporation and Clearwire Corporation*, Applications for Consent to Transfer control of Licenses, Leases, and Authorizations, WT Docket No. 08-94, Files Nos. 0003462540 *et al.*, FCC 08-259, rel. November 7, 2008.

[20] According to Globalstar's 2008 annual report, Globalstar plans to deploy the first ever ATC system with its partner, Open Range Communications, Inc. Open Range has received a loan of $267 million from the Department of Agriculture's Rural Utilities Service program and they intend to deploy a WiMAX wireless service in more than 500 rural communities using Globalstar's spectrum. The first 24 new satellites in Globalstar's new fleet are scheduled to be launched during 2010.

[21] See, *e.g.*, SkyTerra's 2008 annual report, pp. 6-9.

[22] Harbinger's CMRS partner would not be able to mix ATC spectrum and ordinary spectrum, because FCC policy prohibits access to the ATC spectrum by non-satellite-enabled cell phones. Therefore, there is likely to be less congestion on ATC bands compared to regular cellular bands. With less congestion on ATC bands, Harbinger and its CMRS partner could differentiate their service as a premium mobile broadband offering available to customers willing to purchase high-end handsets that include satellite capability. Satellite capability would simply be one of many handset features and might not add substantial costs to the handset. Although it is beyond the scope of this memo to analyze the economics of such a business case, a rough calculation based on some stylized facts may shed light on just how lucrative ATC service could be. Assume Harbinger-SkyTerra-Inmarsat reserves 34 MHz, half of the L-band spectrum, for ATC. (Inmarsat currently uses about half of the L-band spectrum to provide mobile satellite services, and we assume that, for contractual and other reasons, continues to do so.) The most recent market valuation of terrestrial CMRS spectrum was about $19 billion for 52 MHz (based on the 700 MHz auction in 2008, less D-block). Thus 34 MHz is worth about $12 billion at current valuations. Introducing a big block of spectrum could depress the value of all spectrum, but 34 MHz is only about 12 percent of the 274 MHz currently authorized for CMRS, so the effect should not be substantial. The design, construction, and launch of a modern mobile telecommunications satellite costs roughly $1 billion, with relatively low operating costs. According to FCC staff, handset and chipset development and production costs should not be substantial. Thus the financial requirement for a satellite operator to enter the ATC market in partnership with a CMRS incumbent is roughly about $1 billion. Pursuant to the ORBIT Act, mobile satellite spectrum was not auctioned, and mobile satellite operators obtained ATC-eligible spectrum for free. Given the industry's poor financials, the stock price of the mobile satellite operators may not reflect the potential value of the spectrum. If so, an entrepreneur that purchased a mobile satellite property with 34 MHz of ATC-eligible spectrum and successfully rolled out ATC service in partnership with a CMRS incumbent could obtain a rent of $11 billion, equal to the difference between the value of the spectrum ($12 billion) and the cost of developing the required satellite system ($1 billion).

2, Harbinger will make further investments in Terrestar and consolidate even more ATC-eligible spectrum.

The Commission will need to determine whether, on balance, consolidation of ATC spectrum by Harbinger is anti- or pro-competitive. On one hand, consolidation of ATC spectrum could reduce the number of potential suppliers of ATC-enabled services. On the other hand, the successful deployment of ATC, which could be pro-competitive,[23] may require consolidation of mobile satellite resources. The effect of such consolidation on competition in the provision of mobile satellite or CMRS services can only be established through fact-finding and analysis.[24]

**Department of Justice Review.** In August of 2008, Harbinger filed a Hart-Scott-Rodino (HSR) pre-merger notification for the proposed acquisition of Inmarsat by SkyTerra. The Department of Justice's (DOJ) Antitrust Division did not challenge the proposed transaction prior to the expiration of the waiting period. No press release or statement was issued. Due to the procedural changes involved in splitting the transaction into two stages, Harbinger filed an HSR pre-merger notification for the proposed acquisition of SkyTerra by Harbinger (Stage 1) on July 23, 2009. The Antitrust Division did not issue a second request letter. A voluntary submission was made in response to the letter from Antitrust Division staff. That response included four documents evaluating the proposed transaction. The thirty day waiting period following the premerger notification has expired. DOJ has not challenged the proposed transaction and has not issued a press release or statement.

The reviewing attorneys at DOJ frankly answered FCC staff questions regarding why they did not recommend further investigation of the proposed transactions. According to the DOJ attorneys, the overlap in services between Inmarsat and SkyTerra is currently limited to low data-speed vehicle-tracking services in the United States. This is not considered to be an important service. One of the DOJ attorneys stated that the possibility that the Harbinger transactions could lessen potential (*i.e.*, future) competition in mobile broadband services and ATC-enabled services was too speculative to bring before a trial judge, and that DOJ's track record in pursuing potential competition issues had not been successful.[25] He also stated that the business case for mobile satellite services, including ATC, did not appear to be very strong and that the mobile satellite firms were financially unstable, implying that this was not an industry that warranted further scrutiny. A point worth noting is that, in conducting his analysis, the attorney treated Terrestar as controlled by Harbinger, due to Harbinger's considerable financial interests in Terrestar and the fact that Harbinger and Terrestar had interlocking boards of directors.[26]

**Comparison between FCC and DOJ Review.** Review of transactions in the communications industry by the FCC differs from that of DOJ in several ways. Our public interest evaluation necessarily encompasses the "broad aims of the Communications Act,"[27]

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[23] It could enhance CMRS competition.

[24] Were Harbinger to provide a small terrestrial wireless carrier with a large amount of ATC-eligible spectrum, the result could be increased competition in CMRS markets. The effect of Harbinger's partnering with a large terrestrial wireless incumbent on CMRS markets appears more ambiguous.

[25] As an example, he mentioned the Bell Atlantic / NYNEX merger, in which potential geographic competition in the New York LATA between NYNEX and Bell Atlantic was an important issue.

[26] The attorney noted, however, that for antitrust enforcement purposes, Harbinger and Terrestar do not have interlocking boards, because the standard requires both firms to have revenue, which Terrestar does not have at this time.

[27] *See Verizon-Alltel Order*, 23 FCC Rcd at 17461, ¶ 27; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13591, ¶ 15; *SBC/AT&T Order*, 20 FCC Rcd at 18301, ¶ 17.

which include, among other things, a deeply rooted preference for preserving and enhancing competition in relevant markets, accelerating private sector deployment of advanced services, ensuring a diversity of license holdings, and generally managing the spectrum in the public interest.[28] Our public interest analysis may also entail assessing whether the proposed transaction will affect the quality of communications services or will result in the provision of new or additional services to consumers.[29] In conducting this analysis, the Commission may consider technological and market changes, and the nature, complexity, and speed of change of, as well as trends within, the communications industry.[30]

Our competitive analysis, which forms an important part of the public interest evaluation, is informed by, but not limited to, traditional antitrust principles.[31] The Commission and DOJ each have independent authority to examine the competitive impacts of proposed communications mergers and transactions involving transfers of Commission licenses, but the standards governing the Commission's competitive review differ somewhat from those applied by DOJ.[32] Like DOJ, the Commission considers how a transaction will affect competition by defining a relevant market, looking at the market power of incumbent competitors, and analyzing barriers to entry, potential competition and the efficiencies, if any, that may result from the transaction. DOJ, however, reviews telecommunications mergers pursuant to section 7 of the Clayton Act, and if it wishes to block a merger, it must demonstrate to a court that the merger may substantially lessen competition or tend to create a monopoly.[33] Under the Commission's review, the Applicants must show that the transaction will serve the public interest; otherwise the application is set for hearing. DOJ's review is also limited solely to an examination of the competitive effects of the acquisition, without reference to other public interest considerations.[34] The Commission's competitive analysis under the public interest standard is somewhat broader and takes into account whether a transaction will enhance, rather than merely preserve, existing

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[28] *See* 47 U.S.C. §§ 157 nt. (incorporating section 706 of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) (1996 Act)), 254, 332(c)(7)); 1996 Act, Preamble; *Verizon-Alltel Order*, 23 FCC Rcd at 17461, ¶ 27; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13591, ¶ 15; *SBC/AT&T Order*, 20 FCC Rcd at 18301, ¶ 17; *see also 2000 Biennial Regulatory Review Spectrum Aggregation Limits for Commercial Mobile Radio Services*, WT Docket No. 01-14, Report and Order, FCC 01-328, 16 FCC Rcd 22668, 22696, ¶ 55 (2001) (citing 47 U.S.C. §§ 301, 303, 309(j), 310(d)); *cf.* 47 U.S.C. §§ 521(4), 532(a)).

[29] *See Verizon-Alltel Order*, 23 FCC Rcd at 17461, ¶ 27; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13591, ¶ 15; *SBC/AT&T Order*, 20 FCC Rcd at 18301, ¶ 17.

[30] *See Verizon-Alltel Order*, 23 FCC Rcd at 17461, ¶ 27; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13591, ¶ 15; *SBC/AT&T Order*, 20 FCC Rcd at 18301–02, ¶ 17.

[31] *See, e.g., Verizon-Alltel Order*, 23 FCC Rcd at 17462, ¶ 28; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13591, ¶ 16; *AT&T Inc. and BellSouth Corporation Application for Transfer of Control*, WC Docket No. 06-74, Memorandum Opinion and Order, 22 FCC Rcd 5662, 5673, ¶ 21 (2007) ("*AT&T-BellSouth Order*").

[32] *See, e.g., Verizon-Alltel Order*, 23 FCC Rcd. at 17462, ¶ 28.

[33] 15 U.S.C. § 18.

[34] *See Verizon-Alltel Order*, 23 FCC Rcd. at 17462, ¶ 28; *Applications for Consent to the Transfer of Control of Licenses XM Satellite Radio Holdings Inc., Transferor to Sirius Satellite Radio Inc., Transferee*, MB Docket No. 07-57, Memorandum Opinion and Order and Report and Order, 23 FCC Rcd 12348, 12365-66, ¶ 32 (2008) ("*XM-Sirius Order*").

competition, and takes a more extensive view of potential and future competition and its impact on the relevant market.[35]

FCC staff believes that the issue of potential competition warrants further review by the FCC. The likely outcome of the transaction is future consolidation in the provision of mobile satellite broadband services as well as consolidation of ATC-eligible spectrum. We believe that Harbinger has a valid business case for undertaking such consolidation, and that it is possibly anti-competitive. FCC staff concurs with DOJ staff that it is reasonable to consider Terrestar as hypothetically subject to control by Harbinger.

**General Antitrust Standard for Review of Horizontal Mergers.** Together Stages 1 and 2 constitute a horizontal merger in which one party acquires full control over two previously separate entities providing similar services. Economic review of horizontal mergers typically requires that the Commission (1) define relevant markets[36] served by each of the merging parties; (2) identify suppliers in each market; (3) measure the pre-and post-merger market shares of each supplier in each of the relevant markets to identify any change in market concentration due to the proposed merger; and (4) evaluate the likelihood, timeliness, and sufficiency of "competitive entry" (the ease by which competitors of the merged entity could enter a relevant market and limit the merged entity's market power, if any). If the analysis reveals a potential threat to competition, it is necessary to determine whether any conditions could be imposed on the merger to preserve any benefits of the merger while eliminating or sufficiently alleviating the potential for anticompetitive harm.

**Stage 1 Review: Special Requirements.** Although Stage 1 has less potential to cause anticompetitive harm than Stage 2 (because Harbinger will not assume control of Inmarsat in Stage 1), the economic analysis in Stage 1 may actually be more complicated than in Stage 2. Stage 1 analysis requires one more step than Stage 2: the evaluation of Harbinger's less than full control of Inmarsat on competition. (Both stages, however, require evaluation of Harbinger's substantial, but not at present controlling, interests in Terrestar.)

**Information Requirements.** Like all major transactions before the Commission, economic review of this transaction will be fact-intensive. The Harbinger transaction is a case of "first impression" with respect to the mobile satellite industry. Although the International Bureau analyzed the competitiveness of the mobile satellite industry in the Inmarsat-Stratos proceeding, the FCC has never evaluated the competitiveness of the industry based on a full record.[37] Nor has the Commission (as distinct from the Bureau) made a recent finding regarding the competitiveness of the industry. FCC economists currently have access to very little data (inside or outside the FCC) that would be useful for such an evaluation. Since the transaction involves financial interests in so many major participants in the industry (SkyTerra, Inmarsat, TerreStar, ICO, etc.), an evaluation of competition of the mobile satellite industry is required.

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[35] *See, e.g., Verizon-Alltel Order*, 23 FCC Rcd. at 17462, ¶ 28; *XM-Sirius Order*, 23 FCC Rcd at 12365-66, ¶ 32.

[36] Relevant markets are services or groups of services for which consumers have no close substitutes. The essence of the economic review is to identify relevant markets and to determine whether the merged entity will have the ability to raise the price of services in these markets above pre-merger levels, or otherwise act anticompetitively to reduce service quality, availability of service, or innovation.

[37] In the *Inmarsat-Stratos Order*, the International Bureau found substantial competition in the provision of wholesale international MSS services. However, IB's conclusion was based on limited data and is the subject of a pending Application for Review before the Commission.

As our review of the Inmarsat-Stratos merger revealed,[38] we know relatively little about the markets in which mobile satellite operators participate.[39] We also know relatively little about actual and potential competitors, market shares, and barriers to entry. Competition in mobile satellite services is undergoing rapid change, and we need to develop a factual record on this matter.[40] In particular, predicting the amount of competition over the next several years, an important step in merger review, will be a major, fact-intensive, issue.[41]

It is necessary to gather information from the Applicants, their competitors, and MSS customers in order to have a sufficient record to fully evaluate the transaction. Otherwise, FCC staff economists will be unable to render a professional opinion regarding whether the transaction has the potential to cause anticompetitive harm.

**Claimed Benefits.** FCC analysis traditionally recognizes that a proposed transaction may lead to both beneficial and harmful consequences.[42] Applicants have the obligation to

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[38] *Robert M. Franklin, Trustee, Inmarsat, plc, Consolidated Application for Consent to Transfer of Control of Stratos Global Corporation from an Irrevocable Trust to Inmarsat, plc,* IB Docket No. 08-143, Memorandum Opinion and Declaratory Ruling, DA 09-117 (Int'l Bur., rel. Jan. 16, 2009) (*Inmarsat-Stratos Merger Order*).

[39] Although the International Bureau identified international mobile satellite services as a single differentiated product market in the *Inmarsat-Stratos Merger Order*, that finding was based on limited information and is controversial. To conform to *DOJ/FTC Merger Guidelines*, which define relevant markets based exclusively on customer perception, the Commission may wish to use a more disaggregated set of market definitions. (Mistakes in market definitions can have serious repercussions. An overly broad market definition could result in an erroneous conclusion that the merged entity lacks significant market power, by including superfluous products and suppliers in the analysis. Conversely, an overly narrow market definition will exclude genuine competitors and may exaggerate the market power of the merged entity.)

[40] Changes include emerging mobile satellite operators, constellation upgrades, and increased competition from FSS providers using very small aperture terminal (VSAT) technology as well as from terrestrial radio providers. One question is whether technology is driving the mobile satellite industry towards increased specialization and niche markets or towards the supply of bare capacity in commodity-like markets. Also, the proposed merger will consolidate spectrum allocations in the L-band and possibly the 2 MHz band, and we will need to evaluate the likely effect of such consolidation on competition.

[41] Harbinger states in its *Narrative* that Inmarsat's and SkyTerra's satellite services don't overlap except for voice and narrow-band land-mobile services in North America, and that the marketplace for such services is highly competitive. While this would seem to limit the extent of our required analysis, our review is not restricted to the current time period. In merger proceedings, the Commission typically evaluates whether the merging parties are *potential* competitors (*i.e.*, whether absent the merger they would have the incentive and ability to compete with each in the near future). This question will require an extensive factual record to answer. We also need to evaluate whether TerreStar, ICO, and other communications providers in which Harbinger has substantial (albeit non-controlling) ownership interests would be potential competitors to SkyTerra and Inmarsat, absent the merger.

[42] *See, e.g., Verizon-Alltel Order*, 23 FCC Rcd. at 17462, ¶ 29; *XM-Sirius Order*, 23 FCC Rcd at 12366, ¶ 33; *AT&T-BellSouth Order*, 22 FCC Rcd at 5674, ¶ 21; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13592, ¶ 16. For instance, combining assets may allow a firm to reduce transaction costs and offer new products, but it may also create market power, create or enhance barriers to entry by potential competitors, and create opportunities to disadvantage rivals in anticompetitive ways. *See Id.* Our public interest authority enables us, where appropriate, to impose and enforce narrowly tailored, transaction-specific conditions that ensure that the public interest is served by the transaction. *See Id.* Section 303(r) of the Communications Act authorizes the Commission to prescribe restrictions or conditions not inconsistent with law that may be necessary to carry out the provisions of the Act. 47 U.S.C. § 303(r); *see also Verizon-Alltel Order*, 23 FCC Rcd at 17463, ¶ 29; *XM-Sirius Order*, 23 FCC Rcd at 12366, ¶ 33; *AT&T-BellSouth*

submit information sufficient to demonstrate that the benefits they claim to result from the transaction are merger-specific and verifiable.[43] The Applicants should submit information to verify the likelihood and magnitude of each claimed benefit.[44] We must obtain from Applicants and independent sources enough information to evaluate the extensive benefits that Harbinger claims will result from the merger.

**Harbinger's HSR Filings.** As mentioned above, Harbinger has made two HSR filings before the Department of Justice. The first was in August 2008 for the proposed purchase of Inmarsat by SkyTerra. The second, in July 2009, was for the proposed purchase of SkyTerra by Harbinger (Stage 1). The FCC Transaction Team obtained waivers from the parties to review both filings, and FCC staff recently visited DOJ and reviewed the filings. The filings contained some interesting information, but not nearly enough for our review. The HSR documents that are of interest to us are listed in Appendix B.

**Conclusion.** Looking forward to our evaluation of the transaction, this is a case where the facts could cut either way – leading to a conclusion that there really is no danger of anticompetitive harm or, on the other hand, that such a danger does indeed exist. The success of our review will hinge on developing a strong factual record. The information in the Applicants' *Narrative* is descriptive and doesn't include the kind of information that would be useful in defining markets, identifying suppliers, calculating market shares, or evaluating the extent of likely competitive entry.

Appendix A to this memo, *Economic Issues of the Transaction and Relevant Data Sources*, lists the issues that the FCC needs to resolve and, for each issue, describes the required data and data sources. Appendix B, *Potential Sources of Information*, lists potential data sources in more detail, and describes the most relevant HSR data on file at DOJ. In brief, we need to (1) define relevant MSS product and geographic markets and identify suppliers in those markets, by

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*Order*, 22 FCC Rcd at 5674, ¶ 22; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13592, ¶ 17. Similarly, section 214(c) of the Act authorizes the Commission to attach to the certificate for the extension of lines "such terms and conditions as in its judgment the public convenience and necessity may require." *See Id.* Indeed, unlike the role of antitrust enforcement agencies, our public interest authority enables us to rely upon our extensive regulatory and enforcement experience to impose and enforce conditions to ensure that the transaction will yield overall public interest benefits. *See Id. See also Schurz Communications, Inc. v. FCC*, 982 F.2d 1043, 1049 (7th Cir. 1992) (discussing Commission's authority to trade off reduction in competition for increase in diversity in enforcing public interest standard). Despite this broad authority, the Commission has held that it will impose conditions only to remedy harms that arise from the transaction (*i.e.*, transaction-specific harms) and that are related to the Commission's responsibilities under the Communications Act and related statutes. *See, e.g., Verizon-Alltel Order*, 23 FCC Rcd at 17463, ¶ 29; *XM-Sirius Order*, 23 FCC Rcd at 12366, ¶ 33; *AT&T-BellSouth Order*, 22 FCC Rcd at 5674, ¶ 22; *DoCoMo/Guam Cellular Order*, 21 FCC Rcd at 13592, ¶ 17. Thus, we generally will not impose conditions to remedy pre-existing harms or harms that are unrelated to the transaction. *See Id.*

[43] Applicants bear the burden of proving, by a preponderance of the evidence, that the proposed transaction, on balance, serves the public interest. *See* EchoStar's acquisition of DirecTV HDO, FCC 02-284, ¶¶ 25, 169 and 188. *See also* Bell Atlantic/NYNEX, ¶¶ 168-174, referring to Applicants' burden to demonstrate that the claimed efficiencies are merger specific. *See also* Merger Guidelines, Section 4: "[T]he merging firms must substantiate efficiency claims so that the Agency can verify by reasonable means the likelihood and magnitude of each asserted efficiency, how and when each would be achieved (and any costs of doing so), how each would enhance the merged firm's ability and incentive to compete, and why each would be merger-specific. Efficiency claims would not be considered if they are vague or speculative or otherwise cannot be verified by reasonable means."

[44] Information produced in the course of regular business, rather than as part of a presentation to the staff, would be most useful.

means of written questions to, or interviews with, the Applicants, their competitors, and important MSS customers; (2) evaluate market concentration by obtaining usage and revenue data directly from each market participant in each relevant market; (3) evaluate barriers to entry and the likely amounts of future competitive entry, by questioning the Applicants and their actual or potential competitors, obtaining reports from industry experts, and consulting with FCC technical experts; (4) evaluate efficiencies and public benefits claimed by the Applicants by obtaining more information from the Applicants; and (5) clarify the Applicants' partial ownership interests in various satellite operators by obtaining more information from the Applicants.

We recommend sending an information request to the Applicants, as described in the appendices. We also recommend interviewing the Applicants' actual or potential competitors[45] and gathering needed information from them through a formal questionnaire. We also recommend interviewing the Applicants' major customers as well as major customers of their competitors. Such information is typically gathered in merger review by the Department of Justice and has been proven to be highly informative in their investigations. We expect such information would be helpful in our own review of the Harbinger transactions.

[45] Competitors include all mobile satellite operators providing service to U.S. customers; FSS providers of VSAT services to U.S. customers; and terrestrial wireless providers to the extent that they offer compete with mobile satellite services.

# Appendices

## APPENDIX A

Economic Issues of the Transaction and Relevant Data Sources

The immediate issue before the Commission is whether Harbinger's purchase of SkyTerra is the first stage of a process that will lead to decreased competition in mobile satellite services (MSS) markets and, ultimately, higher prices, fewer options, and diminished availability of mobile satellite services for U.S. customers. In Stage 1, Harbinger, which has major non-controlling interests in Inmarsat and TerreStar, as well as other satellite and wireless interests, will buy SkyTerra. In Stage 2, SkyTerra will buy Inmarsat outright. Each stage represents an important step in potential consolidation in the MSS industry. In Stage 1, the Commission should consider whether Harbinger's ownership of SkyTerra would create a risk of competitive harm in relevant markets as a result of strengthened control over SkyTerra, combined with Harbinger's present substantial financial interests in other mobile satellite and other telecommunications companies. If, however, for some reason the FCC chooses not to pursue detailed competitive analysis of Stage 1, it is imperative that such an analysis be conducted for Stage 2.

FCC staff typically evaluates the potential for a transaction to cause competitive harm by relying, in part, on the framework contained in the *DOJ/FTC Horizontal Merger Guidelines* (*Merger Guidelines*). We propose to rely on the *Merger Guidelines* in our analysis, except that we may find it appropriate to extend the time horizon for evaluating the loss of potential competition, as explained below.

As mentioned in the body of the memo, the Harbinger transactions are a case of "first impression" with respect to the mobile satellite industry. Although the International Bureau analyzed the competitiveness of the mobile satellite industry in the Inmarsat-Stratos proceeding, the FCC has never evaluated the competitiveness of the industry based on a full record.[46] Nor has the Commission (as distinct from the Bureau) made a recent finding regarding the competitiveness of the industry. FCC economists currently have access to very little data (inside or outside the FCC) that would be useful in economic review of the transaction. The mobile satellite industry, though growing in importance, is relatively new, small, and undergoing rapid change. There are no generally accepted market definitions for the mobile satellite industry. Unlike with regard to the wireline telecommunications industry, the FCC has never required periodic reporting of usage, revenue, or cost data from the mobile satellite industry. Thus such data is not available for analyzing the instant transaction. Also, unlike most wireline mergers, no party to this proceeding has placed usable data on the industry in the record.

Thus we are left with little or no data on critical issues with which to conduct a competition analysis. The major issues in this proceeding, along with the data required to evaluate them, are identified below:

1. Definition of relevant mobile satellite services product markets and geographic markets.

   **Background.**

   For merger review, the FCC must define "relevant markets," *i.e.*, markets in which the applicants are or could be active. "Markets" are defined as collections of services that customers consider to be close substitutes (adequate alternatives). The rationale for this definition is that it clearly identifies the locus of potential competitive harm: A firm that

[46] In the *Inmarsat-Stratos Order*, the International Bureau found substantial competition in the provision of wholesale international MSS services. However, IB's conclusion was based on limited data and is the subject of a pending Application for Review before the Commission.

controls a market has the incentive and ability to restrict supply and raise prices above cost-based, competitive levels (or act in other anticompetitive ways) because customers cannot find adequate alternative products outside the market which the firm controls. Thus identifying relevant markets is the first step to defining whether a transaction poses the threat of competitive harm. There is, however, no generally accepted list of mobile satellite product markets.[47] (Another issue is how ancillary terrestrial component (ATC) capabilities impact market definitions.) Ideally, market boundaries should be determined through econometric analysis of demand functions, but such an endeavor is probably not feasible due to the dynamic nature of the mobile satellite industry as well as internal limitations at the FCC.

**Data Sources:**

There are two main sources for identifying relevant markets: suppliers of mobile satellite services (*i.e.*, the Applicants and their competitors) and customers of such services.

a. Applicants: Descriptions of services supplied by the Applicants are on their websites, in SEC reports, and in HSR documents filed with DOJ. These data sources will probably have only limited usefulness in determining the degree to which services are close substitutes because such information may not fully describe the way the services are perceived by customers. Additional information can be obtained directly from the Applicants (through document requests, written questions, and interviews by FCC staff).

b. Competitors: Efforts to obtain information that will be helpful in identifying close substitutes should not be limited to the Applicants. Equally important is information from their competitors, including other MSS providers and those FSS and terrestrial radio service providers that compete with MSS providers (*e.g.*, Iridium, Globalstar, various very small aperture terminal (VSAT) providers, and Aircell). Possible sources of information are: websites, SEC documents, and written questions and interviews with FCC staff.

c. Customers: The HSR documents contain lists of SkyTerra's top distributors, retailers, and customers. Similar lists should be obtained from Inmarsat, and clients of other MSS operators, and major VSAT providers. We should contact major customers to ascertain what services they perceive to be close substitutes, through written questions and interviews with FCC staff.

2. Identification of firms that participate in the relevant market (as suppliers) and measurement of market concentration.

**Background.**

In order to evaluate whether the transaction would result in an increase of control over relevant markets, FCC staff must identify the firms that currently participate in (*i.e.*, supply) the relevant markets. As far as FCC staff can tell, the type and number of firms that participate in the mobile satellite markets are undergoing rapid change. New MSS operators such as TerreStar and ICO have launched satellites (but are not yet providing commercial service) and incumbents such as Inmarsat, Iridium, and Globalstar are involved in various

[47] In the *Inmarsat-Stratos Order*, the International Bureau found provisionally that international mobile satellite services constitute a single, differentiated product market. That view may not be consistent with *DOJ Merger Guidelines*, and is the subject of reconsideration in a pending Application for Review. An alternative view is that there are numerous distinct MSS markets for maritime, aeronautical, and remote land applications, for a variety of different data speeds.

stages of upgrading their satellite capabilities. In addition, telecommunications providers outside the MSS industry have begun to offer services in direct competition with MSS providers. These competitors included fixed satellite service (FSS) providers using VSAT as well as terrestrial radio providers (*e.g.*, Aircell, which has begun to offer aeronautical services). VSAT providers in particular have been portrayed in recent proceedings as major competitors of MSS providers.

To the extent that competitors are currently offering service, the FCC needs to measure the firms' market shares (through usage or revenue figures) and develop an estimate of supply concentration in each market. (We will discuss the issue of potential future competition separately, below.) We need to obtain market share data from mobile satellite operators providing service in the United States or to U.S. international customers (*e.g.*, Inmarsat, SkyTerra, Iridium, Globalstar, Orbcom, Thuraya, etc.) We also need to obtain market share data from VSAT providers. This last effort should prove challenging, since at present the FCC staff has little information that could help us to identify the major VSAT competitors. We note that in a previous proceeding, Inmarsat shared statistics with us to illustrate the extent and type of VSAT competition.

**Data Sources:**

*Identification of major suppliers.* The main sources for identifying unknown firms that participate in the relevant markets are known suppliers, including the Applicants, as well as MSS customers.

*Market share data.* Once all major suppliers are identified, FCC staff needs to gather information regarding revenues and units sold for each relevant market. Some information may be available in various independent market studies or SEC company reports. (Some market studies were referenced in the HSR list of documents, but were not in the file that the FCC staff examined.). The market and SEC reports are not a panacea. These reports are not available for all MSS and VSAT providers and may not have information broken out by relevant market as identified by FCC staff. Moreover, the information may be outdated. *Thus FCC staff needs to gather market share information directly from the market participants themselves.* Due to the dynamic nature of the industry, FCC staff should seek to obtain the most recent available information (*e.g.*, 2008 data and, if possible, 1st and 2nd quarter 2009 data).

3. Loss of potential competition.

**Background.**

If one of Applicants (including firms in which it has an ownership interest or other financial arrangement) does not yet compete with the other Applicant, but would likely be an important competitor in the future absent the merger, the FCC must consider that fact. The FCC must evaluate whether the merger could cause the loss of a major competitor and must account for the impact of the loss on competition in the various relevant markets.[48] Because of the "lumpiness" of MSS investment and the long time periods required to roll out major new

[48] Harbinger already has major interests in Inmarsat and TerreStar. Thus consolidation with SkyTerra raises the following issue: Over the next few years, would TerreStar, SkyTerra, and Inmarsat be each other's major competitors in major markets, absent the merger? Would these companies compete in major North American markets for land, sea, and air absent the merger? Is the competition between these major players likely to be less important because of VSATs or terrestrial services? Does the fact that Harbinger does not currently have controlling interests in Inmarsat or in TerreStar lessen the concern?

services, the time horizon for evaluating the loss of potential competition may need to be longer than the usual two years adopted under the *Merger Guidelines*.

**Data Sources:**

We can request information from the Applicants about the status of their plans for developing and making public various services in the near future. We can confirm their answers by referring to information on their website and in various third-party news accounts. We can interview FCC experts on policies and proceedings related to satellite spectrum, international plans for orbital locations, and pending or planned service authorizations. We can also obtain information from competitors of the Applicants.

4. Competitive supply and barriers to entry.

**Background.**

Even if the transaction results in the loss of major actual or potential competitors, potential harm may not occur if there are low entry barriers for firms seeking to enter MSS markets. (A simple explanation for why entry is important is as follows: Loss of competition results in price increases, and incumbents earn above-normal profits. Firms outside the industry or in different sectors of the industry are attracted by these above-normal profits, and enter the relevant markets *if they are able to do so*, ultimately increasing competition and forcing prices and profits back to cost-based levels.) Thus a critical element in FCC staff analysis is the evaluation of entry barriers and the "timeliness, likeliness, and sufficiency" of entry.

Entry barriers consist of anything that prevents entry or makes entry difficult. For new entrants into the satellite industry, potential barriers include, but are not limited to: (1) spectrum scarcity; (2) orbital slot scarcity; (3) regulatory barriers (various FCC, ITU, and foreign PTT approvals, as required); (4) access to innovative technology; and (5) high initial capital outlay requirements (for satellite design, construction, launches, handsets, and regulatory bond requirements).

Another important consideration is whether satellite incumbents can easily switch production to serve MSS markets they do not currently serve, in response to competitive opportunities. An example is the provision of VSAT services by FSS providers to serve customers traditionally served by mobile satellite operators.[49] One of the issues in this proceeding will be whether FSS providers and other telecommunications providers[50] are likely to emerge as major competitive forces serving the relevant markets in the near future. The key issue is the evolution of technology and whether various innovative satellite and wireless technologies can compete for traditional MSS customers. In considering whether these technologies can lead to greater competition in the provision of a given service, FCC staff need to consider the various attributes of each technology (*e.g.*, differences between LEOs and GEOs, latency, power differences, levels of satellite interactivity, up-link and down-link characteristics, orbital slots, antenna characteristics, number and types of transponders, coverage "footprints," bandwidth, ATC capabilities, etc.).

[49] According to some accounts, FSS service via VSATs have introduced significant competition into several markets formerly dominated by Inmarsat.

[50] For instance, Aircell, a terrestrial wireless operator is now offering aeronautical services in the United States and Canada. These services were formerly supplied only by mobile satellite operators.

**Data Sources:**

The main sources will be the (1) Applicants, who will have an incentive to demonstrate that alternative sources of supply exist; (2) competitors, who will provide similar information from their own perspective; and (3) published reports from expert industry consultants, who often make evaluations of these issues the centerpieces of their reports. Such reports seem to have been provided by the Applicants to DOJ as HSR documents.[51] We will also want to consult our own FCC satellite engineers for their views, as well as other FCC experts, especially in the Satellite Division.

5. Efficiencies and public interest benefits.

**Background.**

The Commission must consider whether the proposed transaction is likely to generate redeeming public interest benefits. Merger-specific efficiencies "can enhance the merged firm's ability and incentive to compete, which may result in lower prices, improved quality, enhanced services or new products." (*Merger Guidelines*, Section 4.) In evaluating a transaction, the Commission considers whether the overall effect of the transaction will advance the public interest, employing a balancing process that weighs probable public interest harms against probable public interest benefits.[52] In considering the claimed efficiencies and benefits, the Commission, like the Antitrust agencies, consider only those efficiencies that are merger-specific, i.e., likely to occur with the proposed transaction and unlikely to occur by means other than the proposed transaction. Further, consideration of the claimed efficiencies is limited to those efficiencies which are "cognizable," defined in the *Merger Guidelines* to be "merger-specific efficiencies which have been verified and do not arise from anticompetitive reductions in output or service."

**Data Sources:**

The main sources will be a detailed explanation by the Applicants of how the merger will provide benefits to the public. There is some very general discussion of benefits and efficiencies in the March 27, 2009 Narrative. We would need more information from the Applicants about their claims.

6. Failures and exiting assets.

**Background.**

A proposed transaction is unlikely to lessen competition if, absent the proposed transaction, one of the firms faces imminent failure and that absent the proposed transaction, its assets are

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[51] The HSR documents are: (1) Euroconsult, *World Mobile Satellite Communications Survey, Prospects to 2016*, July 2007. (This document was listed as filed, but was missing from the exhibits.); (2) NSR, *Mobile Satellite Services*, 3rd ed. (June 2007). (This document was listed as filed, but was missing from the exhibits.); (3) Frost & Sullivan, *Satellite Machine-to-Machine (M2M) Market Study*, March 2008. (This document was listed as filed, but was missing from the exhibits.); (4) *MSS Industry Perspectives*, issued by Telecom, Media, and Finance Associates, Inc. (March 31, 2008) Bates SKY VR 509-556; (5) *MSS Business*, July 2008. Bates 557.

[52] *See, e.g.*, *Verizon Wireless-Atlantis Order* at ¶ 26; *XM-Sirius Order*, 23 FCC Rcd at 12363-64, ¶ 30; *Verizon Wireless-RCC Order*, 23 FCC Rcd at 12476-77, ¶ 26; *AT&T-Dobson Order*, 22 FCC Rcd at 20302, ¶ 10; *AT&T-BellSouth Order*, 22 FCC Rcd at 5672, ¶ 19; *ALLTEL-Midwest Wireless Order*, 21 FCC Rcd at 11535, ¶ 16; *Sprint-Nextel Order*, 20 FCC Rcd at 13976, ¶ 20; *ALLTEL-Western Wireless Order*, 20 FCC Rcd at 13062-63, ¶ 17; *Cingular-AT&T Wireless Order*, 19 FCC Rcd at 21543, ¶ 40.

likely to exit the relevant product market. (*Merger Guidelines*, section 5.) Further, it is necessary to demonstrate that no less anticompetitive transaction is available that would prevent these assets from exiting the relevant market. Although the mobile satellite industry has experienced some business difficulties, the Applicants have not asserted a "failing firm defense."

**Data Sources:**

The sources here will be similar to the sources for "Competitive supply and barriers to entry," as this will involve subjective judgment about the future from Applicants, their competitors, and industry experts.

7. Partial ownership. Lessening of competition through coordinated interaction or unilateral effects.

**Background.**

As noted above, Harbinger has a significant, but non-controlling, interest in several MSS providers and other communication providers. Generally, partial interests in several firms in the same market may provide a firm with the incentive and ability to act anticompetitively. We need to determine whether, with the proposed transaction, Harbinger's financial interests are of such a nature as to create the risk of competitive harm in the relevant markets, as described above. There appears to be limited economic literature on this topic, and in conjunction with this section we will review that economic literature.

**Data Sources:**

We need to obtain updated information from the Applicants on their ownership interest in these mobile satellite and telecommunications companies.

**APPENDIX B**

Potential Sources of Information

* *Denotes important data source.*

1. Currently available data at FCC or other government agencies.

- **FCC.** Commission Reports. There is very little on fixed satellite services, including VSATs, in the annual Satellite Competition report, and nothing on mobile satellite services. There is very little information on mobile satellite services in the annual CMRS reports.

- * **SEC.** Recent Inmarsat and SkyTerra SEC filings, as well as SEC filings of other satellite operators (20-F's for foreign companies and 10-K's for domestic companies). We have already obtained filings for Inmarsat, SkyTerra, Globalstar, and ICO.

- * **DOJ August 2008 Filing.** DOJ has retained the 4(c) Hart-Scott-Rodino documents that were filed by the Applicants pursuant to the original merger agreement (Stages 1 and 2 combined). IB staff recently reviewed the filing, and there were some documents and studies that would be useful in evaluating market definitions, market share, supply substitutability, and market power:

  - Euroconsult, *World Mobile Satellite Communications Survey, Prospects to 2016*, July 2007. (This document was listed as filed, but was missing from the exhibits.)

  - NSR, *Mobile Satellite Services*, 3rd ed. (June 2007). (This document was listed as filed, but was missing from the exhibits.)

  - Frost & Sullivan, *Satellite Machine-to-Machine (M2M) Market Study*, March 2008. (This document was listed as filed, but was missing from the exhibits.)

  - *MSS Industry Perspectives*, issued by Telecom, Media, and Finance Associates, Inc. (March 31, 2008) Bates SKY VR 509-556.

  - *MSS Business*, July 2008. Bates 557.

  - SkyTerra customer list. August 29, 2008 Letter to DOJ. This letter lists private network customers: (1) top 2008 service providers (> $100,000 revenue); (2) top 2008 retail dealers (> $100,000 revenue); top 2008 end-users.

  - MSV ATC Business Case Review, Anchor Partner and Wholesale, Top 50 Market Builds, December 12, 2007. Bates 613-31.

  - Satellite and Terrestrial Wireless Business Case Overview, March 2008. Bates 695-707.

  - Exhibit 24 (Sept. 23, 2008). Question (4) to Harbinger: Describe in detail all current or contemplated equity or debt investments by the company in any satellite

service provider, including type of investment, whether debt is convertible to equity or voting securities and the percentage of ownership or voting control.

- Exhibit 25. *Inmarsat Competitive Position.* Presentation by Inmarsat, including an excellent industry timeline of satellite and service roll-outs, including the future.

- Exhibit 26. SkyTerra. September 4, 2008 Letter from Crowell & Moring (Wm. Randolph Smith). Jan. 1, 2006 – present (Sept. 4, 2008) total annual sales (by revenue and units) for each service for (a) world; (b) North America; and (c) United States. SkyTerra owns 11.1 equity and voting interests in TerreStar Networks, a majority-owned subsidiary of TerreStar Corp. SkyTerra owns 13.1 equity and voting interests in TerreStar Global Limited, a majority-owned subsidiary of TerreStar Corp.

- Further notes on DOJ filing: It is not clear whether Inmarsat provided HSR documents, since Inmarsat is not a party to the merger. Since the HSR filing was some time ago, it would be useful to have more recent documents.

- *** DOJ July 2009 Filing.**

  - *DOJ Competitive Landscape DOJ Update, August 17, 2009 (SkyTerra, Inmarsat)

  - Inmarsat and SkyTerra: what does the proposed merger mean for MSS and ATC? (TMF)

  - Global L-Band Satellite Capacity, Oct. 3, 2008 (HARB)

  - Premerger Notification; HSR Tracking System

  - *Reshaping the Wireless World with a Global Spectrum Footprint (CFO), Harbinger (HARB)

  - MSV Business Plan, July 2008 (HARB)

  - Altman Vilandrie & Company, U.S. Wholesale Wireless Operator Plan, Business Model Review, prepared for Augere and Harbinger, June 29, 2009. (HARB)

  - Bankruptcy Docs: Debtors Joint Plan of Reorganization Pursuant to Chapter 11..., DBSD North America Inc. et al, debtors (ICO)

2. <u>Free information available on the Internet</u>

   - This information would be primarily from MSS providers and VSAT providers websites.
   - Satellite magazine articles and news articles.

3. <u>Data available for purchase.</u>

   - Private consultants who are industry analysts may have detailed information regarding the identification of relevant markets, market share, and supply substitutability.

4. Questions to the Applicants, Competitors and Customers

   1. HSR 4(c) documents may shed light on these topics.

   2. * New information requests: This information could come from interviews and questionnaires.

      a. * Questions for Inmarsat and SkyTerra

         i. to identify their customers and potential customers.
         ii. type of existing services offered by Inmarsat and SkyTerra, and by their competitors;
         iii. revenue or volume measures of each service provided by Inmarsat and SkyTerra;
         iv. identification of circumstances under which the customers or potential customers would consider switching to existing suppliers and the cost of doing so;
         v. the relative quality and cost of competing services, including identification of substitute suppliers now or in the near future.
         vi. plans for the provision of ancillary terrestrial component (ATC) and competition with terrestrial wireless services.

      b. * Questions for competitors of Inmarsat and SkyTerra.

         i. to identify their customers and potential customers.
         ii. type of existing services offered by each respondent;
         iii. revenue or volume measures of each service;
         iv. identification of circumstances under which the customers or potential customers would consider switching to existing suppliers and the cost of doing so;
         v. the relative quality and cost of competing services, including identification of substitute suppliers now or in the near future.
         vi. plans for the provision of ancillary terrestrial component (ATC) and competition with terrestrial wireless services.

      c. * Questions for customers and potential customers of Inmarsat and SkyTerra.

         i. type of existing services obtained from Inmarsat and SkyTerra, or competitors;
         ii. identification of circumstances under which the customers or potential customers would consider switching to existing suppliers and the cost of doing so;
         iii. the relative quality and cost of competing services, including identification of substitute suppliers now or in the near future. This information could come from interviews and questionnaires.

Appendix D

SUMMARY
MOBILE SATELLITE OPERATORS IN THE UNITED STATES

| Spectrum Band | Megahertz | GSO/Non-GSO (Number of Satellites) | Services | Deployment |
|---|---|---|---|---|
| L-Band<br>GSO<br>1525 - 1559 MHz up<br>1626.5 – 1660.5 MHz down | 68.0 | • Inmarsat (220)<br>• MSV (200) | • Inmarsat: BGAN<br>• MSV: ATC license; mobile broadband | • MSV: Plans to launch two Boeing satellites in 2009 |
| Big LEO (1.6/2.4 GHz) (1993)<br>Non-GSO<br>1610 - 1626.5 MHz up<br>1613.8 - 1626.5 MHz down<br>2483.5 – 2500 MHz down | 33.0 | • Globalstar (263)<br>• Iridium (175) | • Mobile voice and data services<br>• Globalstar: ATC license | • Globalstar: Launched 4 of 8 satellites in 2007. (Cost of $120 million.). Contract with Alcatel Alenia for 48 next-generation LEOs. ($868 million.)<br>• Iridium: Plans to award contract for new network. ($2 billion.) |
| Little LEO (below 1 GHz)<br>Non-GSO<br>148 – 150.05 MHz up<br>137 – 138 MHz down<br>400 - 401 MHz down | 3.9 | • Orbcom (225)<br>(Note that Orbcom has only 3.05 MHZ. The other 0.85 MHz is unassigned.) | • Non-voice data services, e.g., tracking monitoring, & two-way messaging | |
| 2 GHz (1997)<br>GSO<br>2000 – 2020 MHz up<br>2180 – 2200 MHz down | 40.0 | Under development:<br>• ICO Global<br>• TerreStar | • ICO: ATC | • ICO: Launched Loral GSO in 2008 for ATC. $310 million investment.<br>• Terrestar: Plans to launch Loral GSO in 2009. $500 million investment. |
| TOTALS | 144.0 | 1,038 | | |

## Information Request for Harbinger Transaction

**Document Request: for Harbinger**

1. Several of the documents filed with DOJ in July 2009, listed on page 2 of Appendix B.
2. Euroconsult, World Mobile Satellite Communications Survey, Prospects to 2016, July 2007, and more recent edition, if available
3. NSR, Mobile Satellite Services, 3rd ed. (June 2007), and more recent edition, if available.
4. Frost & Sullivan, Satellite Machine-to-Machine (M2M) Market Study, March 2008.
5. MSS Industry Perspectives, issued by Telecom, Media, and Finance Associates, Inc. (March 31, 2008)

**Information Request: for Inmarsat and SkyTerra**

Current Generation Services:

1. Fully describe the current satellite system including orbital locations, transponder capacity, coverage and throughput for each satellite.
2. List each service currently provided by your company, and provide a detailed description of each of the services, including, but not limited to equipment, degree of customer mobility, price, bandwidth and geographic coverage.
3. For each of the services listed above, describe the categories of customers that account for the majority of demand for those services.
4. For each of the services listed above, state the 2008 sales in units and dollars to all customers.
5. For each of the services listed above, identify the entities that currently compete with your company in the provision of each relevant service, including equipment, mobility, price, bandwidth, geographic coverage.
6. For each of the services listed above, identify the five largest customers, along with the 2008 sales in units and dollars.
7. For each of the services listed above, identify circumstances under which your current customers would consider switching to the suppliers listed in (5), above, and the cost to those customers of doing so.

Next Generation Services:

8. Fully describe your company's next generation system, including anticipated launch date, service area and orbital location(s).
9. For each of the services, provide a detailed description of the services that will be offered with the next generation system, including equipment size, mobility, anticipated price, bandwidth and geographic coverage.
10. Describe the total planned capacity that will be available for the services listed above.
11. For each of the services, identify the entities that you anticipate may compete with your company in the provision of each relevant service, including the anticipated launch date

for new systems, orbital location(s) (another term for Non-GSOs?), customer equipment, anticipated price, bandwidth and geographic coverage.

12. For each of the services listed above, identify circumstances under which, following launch of the services listed in Interrogatory 9, above, your current customers would switch some or all of their demand to those suppliers, and the cost to the customer of doing so

13. For each of the services listed above, identify circumstances under which, following launch of the services listed in Interrogatory 10, above, your next generation customers would switch some or all of their demand to those suppliers, and the cost to the customer of doing so.

Ancillary Terrestrial Component:

14. Describe your plans for utilizing the ancillary terrestrial component (ATC), including geographic coverage, timing of implementation and a detailed description of the services that will use this spectrum

15. For each of the planned services to be offered using ATC, identify entities that provide terrestrial and/or satellite services that might compete with the planned services.

16. For each of the services to be offered using ATC, identify markets in which your company will be using ATC to compete or to compete more effectively with terrestrial and/or satellite providers.

17. List and describe all contracts that have been entered into in order to develop satellites, satellite launches, handset chipsets and handsets that will use ATC.

18. List and describe all contracts with current or future FCC licensees for use of ATC.

19. Describe any plans under development for satellite, satellite launches, handset chips and handsets that will use ATC.

20. List any discussions with other companies that your company has had relating to satellite production, satellite launches, handset chipset development and handset development that will be used in offering services using ATC.

21. List any discussion with other companies that your company has had relating to partnerships, joint ventures or cooperative ventures that involve the potential use of ATC.

**Information Request: for ICO, TerreStar, Iridium and Globalstar, and certain FSS providers[1]**

Current Generation Services:

1. Fully describe the current satellite system including orbital locations, transponder capacity, coverage and throughput for each satellite.
2. List each service currently provided by your company that might compete with any service provided by Inmarsat or SkyTerra, and provide a detailed description of each of the services, including, but not limited to equipment, degree of customer mobility, price, bandwidth and geographic coverage.
3. For each of the services listed above, describe the categories of customers that account for the majority of demand for those services.
4. For each of the services listed above, state the 2008 sales in units and dollars to all customers.
5. For each of the services listed above, identify the entities that currently compete with your company in the provision of each relevant service, including equipment, mobility, price, bandwidth, geographic coverage.
6. For each of the services listed above, identify the five largest customers, along with the 2008 sales in units and dollars.
7. For each of the services listed above, identify circumstances under which your current customers would consider switching to the suppliers listed in (5), above, and the cost to those customers of doing so.

Next Generation Services:

8. Fully describe your company's next generation system, including anticipated launch date, service area and orbital location(s).
9. For each next generation service that might compete with am Inmarsat or SkyTerra current or next generation service, provide a detailed description of the services that will be offered with the next generation system, including equipment size, mobility, anticipated price, bandwidth and geographic coverage.
10. Describe the total planned capacity that will be available for the services listed above.
11. For each of the services listed above, identify the entities that you anticipate may compete with your company and Inmarsat or SkyTerra in the provision of each relevant service, including the anticipated launch date for new systems, orbital location(s), customer equipment, anticipated price, bandwidth and geographic coverage.
12. For each of the services listed above, identify circumstances under which, following launch of the services listed in Interrogatory 9, above, your current customers would switch some or all of their demand to those suppliers, and the cost to the customer of doing so
13. For each of the services listed above, identify circumstances under which, following launch of the services listed in Interrogatory 10, above, your next generation customers

[1] In addition to the MSS operators listed, we would request this information from FSS operators identified by Inmarsat or SkyTerra in response to Interrogatory 5 as entities that compete with Inmarsat or SkyTerra in one or more of the listed services.

would switch some or all of their demand to those suppliers, and the cost to the customer of doing so.

Ancillary Terrestrial Component:

14. Describe your plans for utilizing the ancillary terrestrial component (ATC), including geographic coverage, timing of implementation and a detailed description of the services that will use this spectrum

15. For each of the planned services to be offered using ATC, identify entities that provide terrestrial and/or satellite services that might compete with the planned services.

16. For each of the services to be offered using ATC, identify markets in which your company will be using ATC to compete or to compete more effectively with terrestrial and/or satellite providers.

# Exhibit 7

**Dwayne Hamblin**

**From:** Mark Uretsky
**Sent:** Thursday, October 01, 2009 12:31 PM
**To:** James Ball; Jennifer Balatan; Jim Bird; Neil Dellar; Joel Rabinovitz; Daniel Shiman
**Subject:** FW: does this undermine the procompetitive story?
**Attachments:** ATT Terrestar News Release_FINAL.pdf; TerreStar Distribution Release FINAL.pdf

FYI. Mark

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**From:** Mark Uretsky
**Sent:** Thursday, October 01, 2009 12:27 PM
**To:** Jonathan Baker; Marilyn Simon
**Cc:** Paul deSa; Mark Uretsky; Howard Griboff
**Subject:** RE: does this undermine the procompetitive story?

Jonathan,

This is an interesting development, but we shouldn't jump to conclusions about what it means.

First, although the service is similar to ATC, it is not ATC. TerreStar has a petition for an application to provide ATC pending before the FCC. The GENUS Smartphone does not use TerreStar's spectrum for terrestrial CMRS – it uses AT&T's spectrum only.

Note that, according to the press releases, the service is not a mass market offering. It is meant only for business and government users who will pay roaming surcharges for satellite use. TerreStar itself has only 20 MHz of bandwidth and one important question, which we will need to explore, is how many customers can actually be served over satellite by 20 MHz and other levels of bandwidth.

What does this announcement portend, given that Harbinger owns 44 percent of TerreStar and has 32 percent of the voting shares? Does it indicate that Harbinger is planning or even considering partnering with AT&T for a future mass market ATC service? Not clear. We haven't studied whether Harbinger controls TerreStar, or has a decisvie management role in TerreStar. Note also, that the TerreStar / AT&T partnership appears to be merely a limited distribution agreement. Moreover, it is not an exclusive agreement, according to a senior source at TerreStar. We should not assume that it gives either TerreStar or AT&T any legal rights that would carry over to a full-fledge ATC service.

This is a limited roll-out, more in the line of an experiment for how a cell-sized hybrid phone and hybrid network will perform technologically and commercially. If we are going to read the tea leaves, we need more leaves!

Mark

---

**From:** Jonathan Baker
**Sent:** Thursday, October 01, 2009 8:26 AM
**To:** Marilyn Simon; Mark Uretsky
**Cc:** Paul deSa
**Subject:** does this undermine the procompetitive story?

Does it mean that the merger is unlikely to create a wireless rival to AT&T and Verizon?
(From one of this morning's trade press reports)

AT&T, TerreStar TO OFFER HYBRID SERVICE

AT&T, Inc., said it will work with TerreStar Networks, which provides satellite-based

communications services, to offer an "integrated smartphone mobility solution" that combines "primary cellular wireless connectivity with the ability to connect to a satellite network as a backup, using one phone number and one smartphone device." The company did not say when it would begin selling the service.

News Release

**For more information, contact:**
Melissa Mirabile for AT&T
[redacted]

Warner May, AT&T
[redacted]

# AT&T ANNOUNCES AGREEMENT WITH TERRESTAR TO OFFER INTEGRATED CELLULAR/SATELLITE SOLUTION

*With One Device, Users Can Realize Expanded Voice and Data Coverage from AT&T in the United States and in Offshore Coastal Waters*

**DALLAS, Sept. 30, 2009** — AT&T* has announced plans to work with TerreStar Networks to offer an integrated smartphone mobility solution that will combine primary cellular wireless connectivity with the ability to connect to a satellite network as a backup, using one phone number and one smartphone device.

The AT&T integrated solution will redefine the mobile satellite services experience by providing users with easy access to both cellular and satellite networks through a cutting-edge handset that is both smaller and more feature-rich than previous satellite devices. The TerreStar Genus™ dual-mode cellular/satellite smartphone gives users the option to access theTerreStar™ satellite network when AT&T's cellular wireless network is unavailable. Qualified AT&T wireless users with a line of sight to the satellite will be able to access expanded voice and data coverage in the United States, Puerto Rico, and the U.S. Virgin Islands and in territorial waters.

When cellular networks are unavailable, TerreStar's satellite will act as a cell site in the sky to provide coverage to help users stay connected. The solution announced today is well-suited for government, energy, utility, transportation and maritime users. It can provide a critical communications back-up capability, important to public safety agencies, first responders, emergency services and disaster recovery groups.

"AT&T continues to drive the emergence of new categories of devices and applications that are enhanced by wireless network connectivity," said Joe Lueckenhoff, senior vice president

product management, wireline and mobility services, AT&T Business Solutions. "Today's announcement is the latest addition to our enterprise mobility portfolio. It helps our enterprise and government customers consolidate communications platforms, reduce their telecom expenditures and have communications access on the go."

The AT&T integrated cellular/satellite solution will combine the satellite network-related charges on the customer's regular wireless bill. AT&T's monthly invoice will include the customer's cellular voice and data service charges, the satellite network access subscription feature charge and the satellite voice and data roaming charges.

The TerreStar Genus™ smartphone is a revolutionary device, combining GSM/GPRS/EDGE/UMTS/HSDPA terrestrial wireless capability with satellite voice and data capability in a standard smartphone size and form factor. The device runs on the Windows Mobile operating system to provide rich smartphone functionality and includes premium features such as a 2.6" touchscreen, WiFi, Bluetooth® and GPS.

AT&T and TerreStar will show the integrated cellular/satellite solution at the IACP (International Association of Chiefs of Police) annual conference from October 3 – 7, 2009 in Denver, Colorado, booth number 258.

**Pricing and Availability**

The AT&T integrated cellular/satellite solution is expected to be available for enterprise, government and small business customers and their corporate liable users in the first quarter of 2010. AT&T is working on a similar solution for consumers.

Customers will be required to subscribe to appropriate AT&T cellular wireless voice and data plans and a monthly satellite network access feature. Additional voice and data roaming charges will apply when using the satellite network.

**Find More Information Online:**

| Web Site Links: | Related Media Kits: |
|---|---|
| AT&T Web Site | Wireless Networks |
| AT&T Wireless Web Site | AT&T Mobile Phones |

| | |
|---|---|
| About the AT&T 3G Network<br>TerreStar Web Site | Enterprise Mobility<br>TerreStar Networks |
| **Related Releases:** | **Related Fact Sheets:**<br>AT&T Network Coverage Map<br>Network-at-a-Glance Fact Sheet<br>3G Services Fact Sheet<br>3G Coverage: Cities with 3G Service<br>TerreStar Smartphone |

*AT&T products and services are provided or offered by subsidiaries and affiliates of AT&T Inc. under the AT&T brand and not by AT&T Inc.

**About AT&T**
AT&T Inc. (NYSE:T) is a premier communications holding company. Its subsidiaries and affiliates – AT&T operating companies – are the providers of AT&T services in the United States and around the world. With a powerful array of network resources that includes the nation's fastest 3G network, AT&T is a leading provider of wireless, Wi-Fi, high speed Internet and voice services. AT&T offers the best wireless coverage worldwide, offering the most wireless phones that work in the most countries. It also offers advanced TV services under the AT&T U-verse℠ and AT&T | DIRECTV℠ brands. The company's suite of IP-based business communications services is one of the most advanced in the world. In domestic markets, AT&T's Yellow Pages and YELLOWPAGES.COM organizations are known for their leadership in directory publishing and advertising sales. In 2009, AT&T again ranked No. 1 in the telecommunications industry on *FORTUNE*® magazine's list of the World's Most Admired Companies. Additional information about AT&T Inc. and the products and services provided by AT&T subsidiaries and affiliates is available at http://www.att.com.

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Note: This AT&T news release and other announcements are available as part of an RSS feed at www.att.com/rss. For more information, please review this announcement in the AT&T newsroom at http://www.att.com/newsroom.

**TerreStar Announces Distribution Agreement with AT&T**

***First Satellite Cellular Smartphone to Offer Integrated Service***

**RESTON, VA – September 30, 2009** – Mobile communications provider TerreStar Networks Inc. (TerreStar), a majority-owned subsidiary of TerreStar Corporation (NASDAQ: TSTR), announced today an agreement between TerreStar and AT&T to bring to market the first fully integrated satellite cellular smartphone.

The TerreStar solution will combine AT&T's wireless connectivity with the ability to use an all-IP satellite network as back up throughout the United States. Using one phone number and one device, users will be able to access voice and data services in the United States, Puerto Rico, the U.S. Virgin Islands and offshore coastal waters over either the AT&T cellular network or the TerreStar satellite network.

The TerreStar™ GENUS™ Smartphone is a revolutionary device, combining 3G terrestrial wireless capability with satellite voice and data in a standard smartphone size and form factor. The device uses the Windows Mobile® operating system to provide rich smartphone functionality and includes premium features such as a touchscreen, WiFi, Bluetooth®, GPS and a QWERTY keyboard. The solution is intended to work as a user's everyday cellular smartphone device, with satellite access capability as a secondary option when needed.

"TerreStar is pleased to announce AT&T as a distribution channel. TerreStar remains focused on offering an integrated satellite and terrestrial communications solution to enable true ubiquity and reliability virtually anywhere in the United States to help solve the critical communications and business continuity challenges faced by government, emergency responders, enterprises and rural communities," said Jeffrey Epstein, president, TerreStar Networks.

The TerreStar integrated solution redefines the mobile satellite services experience by providing easy access to both cellular and satellite networks through a cutting-edge handset that is both smaller and more feature-rich than previous satellite devices.

This agreement is one of a series of recent milestones announced by TerreStar. TerreStar launched the world's largest, most powerful commercial satellite, TerreStar-1, on July 1. The first end-to-end call over TerreStar-1 was completed on

July 20th. On August 27th TerreStar announced the successful completion of in-orbit testing.

TerreStar and AT&T will demonstrate the TerreStar GENUS™ Smartphone at a special event on October 5th at the IACP (International Association of Chiefs of Police) annual conference in Denver, CO.

**About TerreStar Networks Inc.**
TerreStar Networks (www.terrestar.com), a majority owned subsidiary of TerreStar Corporation (NASDAQ: TSTR), plans to offer a reliable, secure and resilient satellite terrestrial mobile broadband network that will provide voice, data and video services dedicated to helping solve the critical communication and business continuity challenges faced by government, emergency responders, enterprise businesses and rural communities. TerreStar expects to offer next generation mobile communications through a network of partners and service providers to users who need "anywhere" coverage throughout the United States.

**About TerreStar Corporation**
TerreStar Corporation is the controlling shareholder of TerreStar Networks Inc. and TerreStar Global Ltd. For additional information on TerreStar Corporation, please visit the company's website at www.terrestarcorp.com.

*Statement under the Private Securities Litigation Reform Act:*
*This press release may contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act, with respect to the strategy of TerreStar Corporation, its plans, and the transactions described in this press release. Such statements generally include words such as could, can, anticipate, believe, expect, seek, pursue, proposed, potential and similar words and terms in connection with future results. We assume no obligation to update or supplement such forward-looking statements.*

Windows Mobile is a registered trademark of Microsoft Corporation. Bluetooth is a registered trademark of Bluetooth SIG.

**For more information, please contact:**
Kelly Adams, Director Marketing and Communications
TerreStar Networks
[redacted]

Chris Fallon
Ruder Finn for TerreStar Networks
[redacted]

# Exhibit 8

I want to consider Harbinger's possible business plan regarding its purchase of SkyTerra and Inmarsat and see whether it would or could serve the public interest. We don't have a lot of facts, but I think it is possible to make some reasonable deductions and informed speculations. My provisional conclusion is that while Harbinger is seeking extraordinary profits by acquiring ATC-eligible spectrum, interest is fundamentally is in a highly speculative venture with extr it could, subject to certain requirements by the FCC.

The most likely reason that Harbinger is interest in investing in mobile satellite operators is to obtain ATC-eligible spectrum and roll-out premium broadband CMRS service to the mass market with a major CMRS provider. Given Harbinger's history, it seems evident to me that Harbinger's interest in buying MSS companies is fundamentally speculative in nature. I very much doubt Harbinger is interested in the rather limited financial potential of standard mobile satellite serivces, or even the potentally enhanced profits resulting from consolidating MSS operators and obtaining limited market power. Nor do I believe that Harbinger is interested in standard ATC as a business proposition. By "standard," I mean ATC offered to a customer base of rural, remote and emergercy service users. Although there would be great public benefit in providing such a service, I do not think there is a lot of money to be made in providing such a service. Moreover, Globalstar already has plans to be the first MSS company to offer standard ATC, in 2010, making copycat entry even less attractive to Harbinger.

According to internal FCC reports, Falcone stated to the Chairman that the Harbinger transaction would serve the public interest by offering "standard" ATC service. This may be true, because the kind of ATC service that Harbinger plans to provide is not inconsistent with standard service. could encompass to some extent because the kind of service that I think Harbinger wants to provide would encompass standard ATC but what we think of as stanbecause I thinkuntrue don't doubt that standard service would be an effect part of the off

Then what is Harbinger's business plan

We had an excellent meeting yesterday, with a lot of information exchanged. I want to continue a little further on ATC. I want to move beyond Falcone's self-serving explanation to the Chairman (as reported in the meeting) that the public benefit of the transactions hinges on making wireless telephony to his poor sister-in-law living by the side of a Minnesota lake! What is Harbinger's business plan? The conventional wisdom is he wants to "flip" the ATC spectrum. But what does flipping the spectrum actually entail? It's worthwhile to drill down on this, because I think it will lead to an suprising answer along with a counter-intuitive public policy implication that the FCC could act on. What I going to tell you is a mix of information that I've gleaned from the public record and from FCC subject matter experts combined, frankly, with speculation of my own.

While this may indeed be one worthy result of the merger, I do not believe that it bears any resemblance to Falcone's business case for buying MSS companies, nor do I believe that the providision of wireless service to remote locales is the only possible public interest that could be servec by the merger. I want to discuss what I believe to be Harbinger's actual business case, as I have been able to piece it together from the public record and from talking to FCC staff experts. I also want to discuss how, subject to condition imposed by the FCC, Harbinger's business case could lead it to enter the CMRS market as a maverick providing highly competive state-of-the art broadband wireless service.

I want to emphasize that there is a public interest case to be made for allowing Harbinger to roll out ATC subject to a new regulatory requirement that could be imposed as a voluntary condition as part of the MSS transactions before us (Harbinger's Stage 1 purchase of SkyTerra and the ensuing Stage 2 Sky Terra purchase of Inmarsat) . That regulatory requirement would be that Harbinger cannot roll out ATC out in partnership with a "Tier 1" CMRS incumbent. There is a case to be made that imposition of such a regulatory "gating" or "entry" requirement would be superior (1) to approval of the merger without such a gating requirement; (2) non-approval of the merger; or (3) repossession of the ATC spectrum for auction. Approval of the merger subject to the non-Tier 1 partnership requirement could result in the entry into the CMRS market of a highly competitive "maverick" in the position to provide mass market ubiquitous broadband service at highly competitive prices..

We believe that Harbinger is about to make ATC happen. In fact, it is the only reason why Harbinger is buying MSS properties and undertaking consolidation of the MSS industry (through it purchase of both L-band providers, SkyTerra and Inmarsat through its major financial interest in Terrestar). There is no businessFalcone has no interest in providing

I want to expand a little bit on what Harbinber is likely to do with regard to ATC, since it is, I believe, at the heart of its MSS strategy and represents a potential opportunity for the FCC to advance the public interest. According to press reports, Falcone specializes in identifying very scarce, even rare, assets or resources available for purchase at distressed prices. This is the very definition of ATC spectrum currently controlled by SkyTerra. By purchasing SkyTerra and then Inmarsat, Falcone will control the entire L-band (68 MHz of ATC-authorized spectrum). He further has major interests in Terrestar, which has a pending license to offer ATC on its 20 MHz of spectrum at the 2 GHz band. Much of that spectrum would be available for use over the United StatesOf course, Falcone is not interested in creating

# Exhibit 9

-----Original Message-----
From: Joel Rabinovitz
Sent: Wed 2/10/2010 11:36 AM
To: Paul de Sa; Austin Schlick; Jim Bird; Neil Dellar
Subject: RE: (hopefully) final harbinger conditions - pls read and approve.

Paul, if we're not switching, I'm pretty sure that we need to go back to the original definition of a Tier I. The definition can perhaps be improved, but I don't believe Neil's re-write works. Also, I'm going to take a stab at slightly re-writing your re-write of the last paragraph.

Joel

-----Original Message-----
From: Paul de Sa
Sent: Wed 2/10/2010 11:31 AM
To: Joel Rabinovitz; Jim Bird; Mindel DeLaTorre; John Leibovitz; Tom Peters; Roderick Porter; Austin Schlick; Gardner Foster; Neil Dellar

Subject: RE: (hopefully) final harbinger conditions - pls read and approve.

not switching. here is latest with formatting fixed per jim and all comments incorporated. joel, i have the master so if any changes, pls let me know to avoid version control problems!

austin/tom?
thx, p.

---

From: Joel Rabinovitz
Sent: Wed 2/10/2010 11:24 AM
To: Jim Bird; Paul de Sa; Mindel DeLaTorre; John Leibovitz; Tom Peters; Roderick Porter; Austin Schlick; Gardner Foster; Neil Dellar

Subject: RE: (hopefully) final harbinger conditions - pls read and approve.

I'll fix formatting. I also note that some non-substantive language issues can be changed when we put it in the order.

Neil's suggestion is not correct. The condition is that Harbinger not sell to Verizon and ATT. Not that it not sell to Rural Telco just because Rural Telco happens to be the largest (only) provider in an EA. If we're switching, Henry is going to be very surprised. Please let me know!

-----Original Message-----
From: Jim Bird
Sent: Wed 2/10/2010 11:20 AM
To: Paul de Sa; Mindel DeLaTorre; John Leibovitz; Tom Peters; Roderick Porter; Austin Schlick; Gardner Foster; Joel Rabinovitz; Neil Dellar

Subject: RE: (hopefully) final harbinger conditions - pls read and approve.

Great work! I have only three comments:

1. The formatting is inconsistent in that Condition 1 has no paragraph number, while the other two do.

# Exhibit 10

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**Discussion of Possible Conditions**

- Require SkyTerra to build a mobile 4-G broadband network to substantially all of the [continental] United States
  - This is what they are promising to do, and can do only if Harbinger acquires SkyTerra. There are potential anticompetitive harms from the transaction. The Commission could decide that the benefits of such a network outweigh the potential harms.

- Require SkyTerra to execute its business plan.
  - Similar to above but holding them to a greater degree of specificity. Doubtful that the Commission has done this in the past; locks applicants into possibly uneconomic business plans; makes it difficult for the applicants to react tom changing business conditions; puts the Commisison in the position of micromanaging applicants' business.

- Forbid SkyTerra from entering into contracts with a major CMRS provider (just ATT and Verizon or Sprint and T-Mobile also?)
  - No nexus to the transaction, and SkyTerra could do this today (and could, and perhaps would, if we denied the transaction).
  - Many questions as to whether such a condition would not be arbitrary and capricious and thus overturned in court. For example:
  - Why only SkyTerra? If this is an issue, its an issue for the entire MSS industry, and possibly more (FSS, etc.).
  - If this is an issue, better handled through restrictions on the major wireless carriers, not through restrictions on the MSS providers.
  - TerreStar has already partnered with ATT; why are we preventing Verizon from partnering with SkyTerra?
  - Might not a partnership with T-Mobile be in the public interest?
  - If SkyTerra's business plan were successful, would we prevent it from selling 10% of its capacity to a wireless provider?

# Exhibit 11

Confidential Information - Subject to Protective Order in IB Docket No. 08-184
before the Federal Communications Commission

# Reshaping the Wireless World

REDACTED

Harbinger

Confidential Information - Subject to Protective Order In IB Docket No. 08-184
before the Federal Communications Commission

# Executive Summary

- There is opportunity for a disruptive play to change the wireless landscape, return choice to consumers, and break the incumbents stranglehold on value
- There is a compelling consumer value proposition and financially attractive business model for the wireless operating company partner
- The L-BandCo entity is financeable, has attractive economics, and will make money from day 1
- There is significant international expansion opportunity

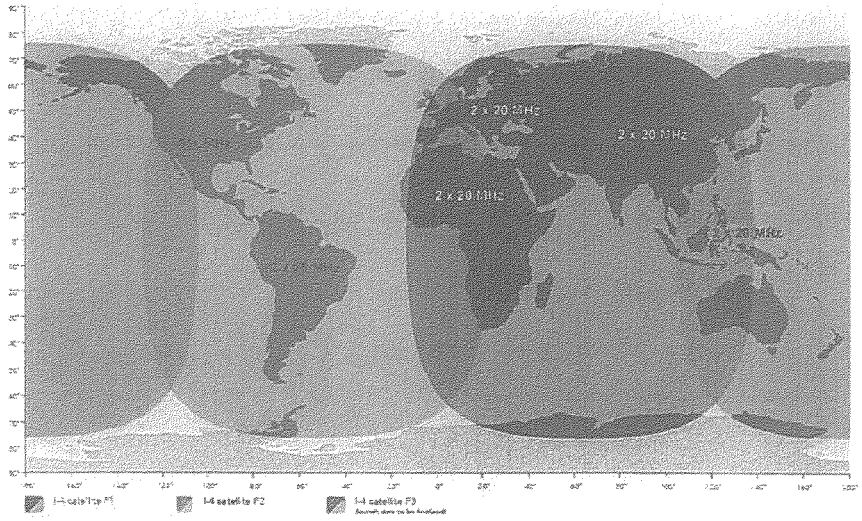


HARB FCC 0000392

Confidential Information - Subject to Protective Order in IB Docket No. 08-184
before the Federal Communications Commission

# The only path to this future is consolidation of L-band spectrum…

## Consolidated satellite spectrum coverage map




Source: [illegible] company website and SkyTerra financials.

Confidential
15

Confidential Information - Subject to Protective Order in IB Docket No. 08-184
before the Federal Communications Commission

# ...because L-Band is the last major block of 4G-ready spectrum

**US spectrum useable for mobile communications**

| Encumbered by 2G and 3G subscribers; takes 4-5 years to re-farm to 4G | Occupied by satellite operations | Slated for auction | Ready for 4G deployment |
|---|---|---|---|
| **Cellular** 800/900 (65) | **L-band** 1.6 GHz (28) | **D-block*** 700 MHz (10) | Available L-band 1.6 GHz (40) |
| **PCS** 1.9 GHz (120) | **Big LEO** 1.6 GHz (32) | **AWS II **** 1.9 GHz (10) | WiMAX 2.5 GHz (90) |
| **AWS I** 1.7/2.1 GHz (90) | **S-band** 2.1 GHz (40) | **AWS III ***** 2.2 GHz (25) | A, B & C block 700 MHz (45) |
| | | **WCS****** 2.3 GHz (30) | |

- ATC allows what was once satellite-only spectrum to be used in terrestrial networks and thus compete with mainstream carriers
- L-band represents the last block of attractive spectrum to build a greenfield LTE network
- New administration wants to see ATC built out
- Two 10x10 MHz carriers are available on new L-band, while Verizon and AT&T will only have 11x11 MHz and 12x12 MHz each respectively to deploy LTE
- Therefore REDACTED will have the deepest 4G network available

* Public safety block
** Auction timing, exact rules & regulations not clear
*** Unresolved interference conflicts with satellite radio
Source: FCC

Confidential
16

# Exhibit 13

**Kim Mattos**

**From:** Robert Nelson
**Sent:** Thursday, July 22, 2010 7:10 AM
**To:** Gardner Foster; Roderick Porter
**Subject:** RE: Meeting next week on launch delay?

This is a meeting set up because they are going to want to move their milestones back. Rod told me that because of this, he wanted the presentation to be made to the senior group. Rod's concern is that the delay in meeting the milestones will result in them not meeting the commitments of the merger.

---

**From:** Gardner Foster
**Sent:** Thursday, July 22, 2010 6:40 AM
**To:** Robert Nelson; Roderick Porter
**Subject:** Re: Meeting next week on launch delay?

Defer to Rod but I don't think so. A different group from lightsquared is comming in to discuss the big plan next wednesday to the senior group.

---

**From:** Robert Nelson
**To:** Roderick Porter; Gardner Foster
**Sent:** Thu Jul 22 06:37:38 2010
**Subject:** Fw: Meeting next week on launch delay?

Rod this ia the meeting you wanted with the senior group.

---
Sent from my BlackBerry Wireless Handheld

---

**From:** Jeff Carlisle [redacted]
**To:** Gardner Foster; Robert Nelson
**Cc:** Lin, Tony [redacted]; Henry Goldberg [redacted]
**Sent:** Wed Jul 21 21:19:27 2010
**Subject:** Meeting next week on launch delay?

Dear Gardner and Bob,

As I discussed with Bob, and mentioned to Rod and Gardner, we'd like to come in soon to discuss the details of the launch delay caused by the need to replace certain critical components. We'd bring Jeff Snyder (our head of satellite operations), Tony, Henry and me. The issue here is pretty straightforward – describing the mechanical issue with the components, which will delay us to December/January to make sure our satellite will launch with a full life span. So please advise as to the best times for you. Jeff Snyder is key to the meeting, and the best days for him are Tuesday or Friday. If you prefer we can also do early the week following.

Gardner, Henry advised you of a separate meeting on the 28th. This is independent of that meeting and is focused on amendment to our pending application for extension of the launch milestone.

Best regards,

Jeff

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# Exhibit 14

**From:** Paul de Sa [redacted]
**Sent:** Tuesday, September 14, 2010 12:01 AM
**To:** Adelstein, Jonathan - Washington, DC [redacted]
**Subject:** RE: Thanks!

---

thx jonathan, i think we will get there! re harbinger happy to hook you up, although one thought is that at the moment the ball is in openrange court (in that they have the term sheet), so i wonder if rather than spending your intervention bullet now when no issues with negotiation, whether it wld be better to wait until if/when a problem arises after the fcc order comes out? (dont want to give harbinger any ideas about sticking it to openrange:). totally your call tho, just let me know what u prefer. btw1 we are shooting to get order out by eod tmrw. btw2 sorry i wont be able to make the rescheduled satellite meeting on fri as am out of town, but pls let me know if can help on anything before or after.

best, p

---

From: Adelstein, Jonathan - Washington, DC [mailto: [redacted]
Sent: Mon 9/13/2010 3:44 PM
To: Paul de Sa
Subject: Thanks!

Thanks for taking so much time for the helpful meeting today. Would you mind letting the Harbinger folks know I will call them soon so we look like a coordinated effort so they don't feel they have unlimited leverage to stick it to Open Range? And, if you could, please let me know who you suggest I contact there and what a good number would be. Thanks again for your help with this.

Ex. 91