Jed Margolin 1981 Empire Rd. VC Highlands, NV 89521-7430
775-847-7845
May 1, 2011

Storey County Commissioners
Storey County, Nevada

Reference: Taormina Towers Comments #1

Dear Storey County Commissioners,

This is regarding Tom and Midge Taormina's application for a Special Use Permit Case No. 2011-010. Please put this in the permanent public file for the issue.

I agree with the recommendations of the Planning Commission "to maintain the four (4) existing amateur ham radio antenna towers applicable to this SUP in accordance with the limitations set forth hereby and deny installation of any additional towers on the property located at 370 Panamint Road (APN 003-431-18), Highland Ranches, Storey County, Nevada and to include all applicable conditions presented in the addendum (See Planning Commission Minutes dated 3/3/11)."

I urge you to adopt their recommendation.

I am sending this letter to support their recommendation. Because of the amount of material I am splitting up my comments into several letters. This is letter #1.

A. This is in response to Fred Hopengarten's posting on the Yahoo group (posted by Tom Taormina on March 25, 2011). Because of its length I am dividing it into several separate letters. This is Part 1.

Part 1 - Third Party Communications

> **Posted by Tom Taormina March 25, 2011**
> **Prepared by Fred Hopengarten, Esq.**
> **March 24, 2011**
>
> **At the Planning Commission hearing, the claim was been made that "Tom wants quality comparable to the Voice of America in their shortwave broadcasts." In e-mail to the VCH listserv, this claim was repeated: "His technical arguments are bogus. He wants to have reliable communications with Europe and Asia with the same quality of communications that the Voice of America strives for in its short wave broadcasts. "**
>
> **Response**
>
> **This claim is not true, and contains several misunderstandings.**
>
> **1. The claim confuses the use of a widely accepted software tool (Voice of America Coverage Analysis Program, or VOACAP) with a reliability or performance goal (such as 90% reliability, or 57% reliability).**

2. The VOA reliability goal is 90% (6.3 days out of 7). The Taormina reliability goal is a more modest 57% (4 days out of 7).

{The entire posting is appended.}

OK, I will give you that. Tom's reliability goal is only 57% instead of VOA's 90%.

But that does not explain why Tom needs to communicate with Europe and Asia in the event of an emergency.

1. Is this for an emergency in Storey County? If it is, why would we need communications with Europe and Asia?

2. Is this for an emergency in Europe and Asia?

The recent disaster in Japan is a good example.

Tom got some nice publicity from the great misfortune in Japan. There was a piece broadcast on KOLO-TV. (I happened to see it.)

A story made it into the KOLO-TV archives: http://www.kolotv.com/mobi/news?storyid=117910934

The story, dated March 13, 2011 says:

> **Nevada Ham Radio Operators Contact Japan**
>
> Updated: 8:54 PM Mar 13, 2011
> Reporter: Lauren Garber
> HAM Radios for Japan
>
> If you're having trouble getting in touch with friends or family in Japan, a local group of Ham radio operators may be able to help.
>
> Right now in Japan, many phone lines and cell towers have been knocked out, and internet access is hard to come by.
>
> But some local operators using Ham radio technology have already make contact with other Ham radio operators in Japan.
>
> In some of the harder-hit areas of Japan. Generator supported Ham radios are the only way to communicate.
>
> Operators say they can put people in Japan in touch with people from Reno, just as soon as they get approval from the Japanese government.
>
> "With communications being down, there's a lot of folks in Japan who'd like to get word back to their family member or employers here in the United States that they're ok, and that they're having problems and we can transfer that information for them," said Tim O'Shea, Emergency Coordinator for Washoe County.

> Operators say some people think Ham radio is a dying form of technology, but it's actually gaining popularity.
>
> They're willing to help you make contact with loved ones in Japan. Contact Ham radio operator Tom Taormina at 775-847-7917 for more information.

That sounds like a valuable public service.

Here is another nice piece. This one, dated March 14, is from the ARRL. http://www.arrl.org/news/japan-asks-radio-amateurs-to-keep-frequencies-clear-as-country-goes-into-recovery-mode-after-devasta .

Here's the part about Tom.

> In Northern Nevada, hams spent the weekend preparing to handle health and welfare messages in and out of Japan. In a joint exercise, Storey County and Washoe County ARES® members spent two days establishing communications protocol on HF, VHF and on Internet-based voice and data communications systems. According to ARRL Storey County Emergency Coordinator Tom Taormina, K5RC, this was the first time that many of the ARES® members used HF communications to operate in a joint exercise with neighboring counties and foreign countries.
>
> Taormina said that more than a dozen Japanese hams were contacted, all of whom were outside the earthquake area. "We are now on standby, awaiting permission of the Japanese government to begin formal third party communications relays," he said.

Wait a minute. What's the part about awaiting permission from the Japanese government to begin formal third party communications relays?

From:
http://wireless.fcc.gov/services/index.htm?job=about_1&id=amateur#Third%20Party%20Communications

> Q: What is a "third-party communication"?
>
> Section 97.3 defines the term "third-party communication" as a message from the control operator (first party) of an amateur station to another amateur station control operator (second party) on behalf of another person (third party).

And from:
http://wireless.fcc.gov/services/index.htm?job=about_2&id=amateur

> **Third Party Communications**
>
> Section 97.115 of the Commission's Rules, 47 C.F.R. §97.115, authorizes an amateur station regulated by the FCC to transmit a message from its control operator (first party) to another amateur station control operator (second party) on behalf of another person (third party). No amateur station, however, shall transmit messages for a third party to any station within the jurisdiction of any foreign government whose administration has not made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties.

> The following countries have made the necessary arrangements with the United States to permit an amateur station regulated by the FCC to exchange messages for a third party with amateur stations in: Antigua and Barbuda, Argentina, Australia, Belize, Bolivia, Bosnia-Herzegovina, Brazil, Canada, Chile, Colombia, Federal Islamic Republic of Comoros, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, The Gambia, Ghana, Grenada, Guatemala, Guyana, Haiti, Honduras, Israel, Jamaica, Jordan, Liberia, Republic of the Marshall Islands, Mexico, Federated States of Micronesia, Nicaragua, Panama, Paraguay, Peru, Philippines, St. Christopher and Nevis, St. Lucia, St. Vincent and the Grenadines, Sierra Leone, South Africa, Swaziland, Trinidad and Tobago, Turkey, United Kingdom (special event stations with call sign prefix GB followed by a number other than 3), Uruguay, and Venezuela. The United Nations also has arrangements with the United States to permit an amateur station regulated by the FCC to exchange messages for a third party with amateur stations 4U1ITU in Geneva, Switzerland, and 4U1VIC in Vienna, Austria.
>
> No amateur station regulated by the FCC shall transmit messages for a third party to any amateur station located within the jurisdiction of any foreign government not listed above. This prohibition does not apply to a message for any third party who is eligible to be the control operator of the station.

Japan isn't on the list.

I don't see any Asian countries on the list of countries that have given permission for third party communications.

The only European countries on the list are:

1. Bosnia-Herzegovina, which is in Southern Europe, on the Balkan Peninsula.

2. United Kingdom (special event stations with call sign prefix GB followed by a number other than 3).

3. The United Nations also has arrangements with the United States to permit an amateur station regulated by the FCC to exchange messages for a third party with amateur stations 4U1ITU in Geneva, Switzerland, and 4U1VIC in Vienna, Austria.

Australia is on the list, but not New Zealand.

The only countries in the Middle East to allow third party communications are Israel and Jordan. (The late King Hussein of Jordan was an active ham with the callsign JY1.)

Technically, Turkey is a Eurasian country.

And BTW, if you haven't heard of the Federal Islamic Republic of Comoros, Comoros consists of three main islands and numerous islets in the Indian Ocean between Mozambique and Madagascar.

Is this why Tom had to wait for the Japanese government to give its permission for third party communications.

I sent an email to Bob Vallio (W6RGG) the ARRL Director of the Pacific Division. He eventually responded:

Hi Jed,

Thank you for being a member of ARRL. I'm sorry it has taken this long to get back to you, but I wanted to be certain that I did not provide you with less-than-adequate information. Here is a quote from ARRL CEO, David Sumner, K1ZZ.

> Bob, no bilateral agreement is necessary. The rules changed after WRC-03 (see sidebar on pages 42-43 of September 2003 QST). The specific FCC cite is 97.115(a):
>
> > An amateur station may transmit messages for a third party to:
> >
> > (1) Any station within the jurisdiction of the United States.
> >
> > (2) Any station within the jurisdiction of any foreign government when transmitting emergency or disaster relief communications and any station within the jurisdiction of any foreign government whose administration has made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties. No station shall transmit messages for a third party to any station within the jurisdiction of any foreign government whose administration has not made such an arrangement. This prohibition does not apply to a message for any third party who is eligible to be a control operator of the station.
>
> So there's no need for an agreement. It's a unilateral decision of the Japanese administration whether or not to allow their amateurs to conduct emergency or disaster relief communications on behalf of third parties.
>
> As a practical matter there is no reason whatsoever for third party prohibitions in these days of Skype, Facebook, Twitter, etc. IARU tried to reverse the default condition for routine third party traffic at WRC-03 so that it would be permitted in all cases unless a government objected, but the Arab group in particular wouldn't go along.
>
> 73,
>
> Dave K1ZZ

I hope this is helpful.

73, Bob -- W6RGG

{Emphasis added, by me}

It looks like a U.S. amateur station may transmit messages for a third party to any station within the jurisdiction of any foreign government when transmitting emergency or disaster relief communications but it still requires the permission of the foreign government. However, the permission of the foreign government

is all that is needed. It does not have to go through the FCC, which has apparently not updated its Web site since 2003. The Web site is called Amateur Radio Service - About Amateur *International Arrangements* http://wireless.fcc.gov/services/index.htm?job=about_2&id=amateur

Did Tom get permission from the Japanese government to begin formal third party communications relays?

I don't know. If he did you would think he would promote it.

A few days ago I contacted a Diplomatic Assistant at the Embassy of Japan in Washington DC. He is going to look into it but it might take a week or so because this is Golden Week in Japan and everyone is on holiday.

The reason for the prohibition of third party communications is because:

1. Amateur Radio is a non-commercial service.

2. There are commercial services which are in the business of providing direct and third party communications.

This second part was especially true for the first several decades of amateur radio. In the 1920s there was no Internet, few people had telephones, and long distance calling was difficult and expensive. For example, until 1951 long distance calling was performed by manual patching in the route of the call by a series of long-distance operators; connecting a coast-to-coast call this way thus took up to 23 minutes.

The first self-dialed customer-connected long-distance telephone call in North America was made much later on November 11, 1951 when Mayor M. Leslie Downing of Englewood, New Jersey called Mayor Frank Osborne of Alameda, California, using AT&T's Direct Distance Dialing feature. This was the first call dialed with an area code, using what is now called 10-digit dialing, and was connected automatically within 18 seconds. (Source: AT&T http://www.corp.att.com/attlabs/reputation/timeline/51trans.html)

This was only for calls within the United States.

Starting in 1927, transatlantic telephone service was radio-based.

TAT-1 (Transatlantic No. 1) was the first transatlantic telephone cable system. It was laid between Gallanach Bay, near Oban, Scotland and Clarenville, Newfoundland between 1955 and 1956. It was inaugurated on September 25, 1956, initially carrying 36 telephone channels.
(Source http://atlantic-cable.com/Souvenirs/1956TAT-1/)

It cost $27 for the first three minutes (Source: http://www.corp.att.com/history/nethistory/milestones.html)

Assuming it was $27 in 1956 dollars, that would be $221.87 in 2011 dollars. For three minutes.

(I calculated it from the Consumer Price Index: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt .
It normalizes the chart to 1982-84=100. 1956 is 26.8; 2011 is 220.223. The ratio is 220.223/26.8 = 8.22)

And, for you young people, the quality of transatlantic telephone service was really crappy until geosynchronous satellites, and then fiberoptic cables came into use. (They stopped using satellites because the 0.25 second time delay up to the satellite and back down again confused people.)

Because of the expense of long distance (and transatlantic and transpacific) telephone calls people sent telegrams (through a land based system) and cablegrams (through an undersea cable).

Radio Amateurs were permitted to send third party messages within the United States as long as they didn't charge for it but were prohibited from sending third party messages outside the United States with the exception of the countries on the list.

Why is it necessary for governments to decide when third party communication by radio amateurs is permitted? Why not just give blanket permission for third party communications during emergencies?

Because then you would be leaving it up to radio amateurs like Tom to decide what constitutes an emergency.

B. Shortly after the disaster in Japan I did a quick search for how the international community was planning to help: http://www.sdarc.org/NewsView/tabid/90/ArticleID/227/CBModuleId/2818/Default.aspx . The ability to find people might have improved since then.

AMERICAN RED CROSS RESPONDS TO EARTHQUAKE IN JAPAN
FOR IMMEDIATE RELEASE

Media Contact:
Brittany Gotschall | Manager, Communications and Marketing
Brittany.gotschall@sdarc.org, (858) 205-0148

Teri Klemchuk | Coordinator, Communications and Marketing
teri.klemchuk@sdarc.org, (858) 205-2082

AMERICAN RED CROSS RESPONDS TO EARTHQUAKE IN JAPAN
Accepting Monetary Donations for Relief Efforts

San Diego, March 11, 2011 – A magnitude 8.9 earthquake hit Japan's east coast Friday prompting a Tsunami Warning for Guam, Hawaii, Northern Mariana Islands and all the Pacific Coast. According to Cal EMA, a TSUNAMI WARNING is in effect for California Coastal areas north of Point Conception in Santa Barbara County to the Oregon Boarder meaning residents need to move to higher ground and out of the mapped inundation zones. A TSUNAMI ADVISORY is in effect for California Coastal areas south of Point Conception in Santa Barbara County meaning significant, widespread inundation is not expected for areas under an advisory. Currents may be hazardous to swimmers, boats and coastal structures and may continue for several hours after the initial wave arrival.

Emergency Operation Centers are opened in the affected areas and staffed by the chapters. American Red Cross chapters in the Pacific islands of Hawaii, Northern Mariana Islands, Guam as well as in west

coast of the U.S. are ready to provide assistance as needed in their communities. Our supply warehouses are activated and we are working closely with state officials in Hawaii and the West Coast.

"Our hearts go out to the people of Japan and the other survivors of the earthquake and tsunami," said Joe Craver, CEO American Red Cross San Diego/Imperial County Chapter. "Right now, the American Red Cross is in discussions with the Japanese Red Cross to assess their needs and see how we can help."

At this time, the American Red Cross can accept donations designated to the Japan Earthquake and Pacific Tsunami. Those who want to help can go to www.sdarc.org or call 858-309-1278. Your gift to the American Red Cross will support our disaster relief efforts to help those affected by the earthquake in Japan and tsunami throughout the Pacific.

Currently, the Red Cross in unable to accept inquiries to contact or locate family and friends in Japan. However, there are several resources available. People in Japan and abroad can register on the website to inform their family and friends that they are safe and provide their current contact details, while looking for people can check the list for information. They can also register the names of family members and friends, encouraging them to get in touch. The website is http://www.icrc.org/familylinks.

Inquiries concerning U.S. citizens living or traveling in Japan should be referred to the U.S. Department of State, Office of Overseas Citizens Services at 888-407-4747 or 202-647-5225.

If you have the mobile phone number of your family member in the affected areas, you may utilize the following services to check whether he/she has registered his/her message(s) on this service. Services are available in English and Japanese.

- **DoCoMo: http://dengon.docomo.ne.jp/Einoticelist.cgi?es=0**
- **SoftBanK: http://dengon.softbank.ne.jp/pc-e1.jsp**
- **Willcom: http://dengon.willcom-inc.com/dengon/Top.do?language=E**

About the American Red Cross, San Diego and Imperial Counties Chapter
The American Red Cross is not a government agency and relies on the generosity of the American people to provide our programs and services. The San Diego/Imperial Counties Chapter is leading the effort to make San Diego and Imperial Counties "America's most prepared communities." With the public's ongoing support we provide life saving preparedness training; disaster relief services; 24-hour emergency services to deployed military personnel and their families; and nutritional counseling through our Women, Infants and Children (WIC) program. For more information about or to support the chapter please contact (858) 309-1200 or visit www.sdarc.org.

Even immediately after the earthquake, tsunami, and explosion at the Fukushima nuclear plant large parts of Japan were undamaged. They had electricity, Internet, and cell phone service.

If you wanted to reach someone in Japan to find out if they were ok the first thing to do was to call their cell phone number. The chances are that they would answer.

The next recommended step was to send them email.

Many of the radio amateurs in Japan had electricity, Internet, and Cell phone service.

They didn't need Tom's heroic efforts to contact them directly.

73,

Jed Margolin
WA2VEW

{Hopengarten's complete posting on Yahoo Group}

Posted by Tom Taormina, March 25, 2011.
Prepared by Fred Hopengarten, Esq.
March 24, 2011

At the Planning Commission hearing, the claim was been made that "Tom wants quality comparable to the Voice of America in their shortwave broadcasts." In e-mail to the VCH listserv, this claim was repeated: "His technical arguments are bogus. He wants to have reliable communications with Europe and Asia with the same quality of communications that the Voice of America strives for in its short wave broadcasts. "

Response

This claim is not true, and contains several misunderstandings.

1. The claim confuses the use of a widely accepted software tool (Voice of America Coverage Analysis Program, or VOACAP) with a reliability or performance goal (such as 90% reliability, or 57% reliability).

2. The VOA reliability goal is 90% (6.3 days out of 7). The Taormina reliability goal is a more modest 57% (4 days out of 7).

Explanation

VOACAP is a piece of software. It is a tool developed over many years under contracts sponsored by:

. U.S. Army Strategic Communications Command, Fort Huachuca, AZ,

. U.S. Department of Commerce, National Telecommunications & Information Administration, Institute for Telecommunication Sciences, Boulder, CO, and

. Voice of America, Washington, DC

As a piece of software, VOACAP is the most widely used high-frequency (shortwave) performance prediction software in the world. It was not developed by or for radio amateurs. Anyone can use this tool to predict shortwave communications reliability. Using VOA software does not mean you want VOA reliability.

The VOA reliability goal is 73 dB/1-Hz SNR (Signal-to-Noise Ratio) target for a VOA 6 kHz bandwidth

AM signal. VOA designs are aimed at achieving this goal 90% of the time.

The Taormina reliability goal is 40 dB/1-Hz SNR target for a ham radio 2.4 kHz bandwidth single-sideband (SSB) voice signal. The Taormina design is aimed at achieving this goal 57% of the time, assuming the legal limit for amateur radio of 1,500 watts transmitter power.

The difference between the VOA reliability goal and the Taormina goal is 33 dB, or a factor ~2000:1

The opponent's claim makes an error common to neophytes trying to understand the VOACAP software. It fails to recognize that in VOACAP the Required SNR is the signal-to-noise ratio in a 1-Hz receiving bandwidth. The reason VOA chose to express the required SNR in a 1-Hz bandwidth is because it makes VOCAP a universal tool, capable of being used for various modes of communications. Voice, CW (continuous wave, i.e., "Morse Code"), RTTY (radio teletype), and other digital modes have different bandwidths. A user of VOACAP need only enter the required SNR for the particular mode.

VOA looks for a 73 dB/1-Hz required SNR with a 90% reliability for an AM DSB (double sideband with carrier) signal. A typical bandwidth for such a signal is 6000 Hz. Thus, the required SNR in a 6000 Hz bandwidth would be: 73 - 10 log10 (6000/1) = 35 dB/6000-Hz SNR, their desired level of service, sometimes referred to as "armchair copy." A 73 dB/1-Hz (35 dB/6000-Hz) SNR would be suitable for reasonably good reception of music, as well as voice.

To achieve its goal of 90% reliability or 73 dB SNR/1-Hz, VOA employs shortwave transmitters of up to 500,000 watts, with gigantic antenna fields, with many 300-foot high towers. See, for example, VOA Sao Tome (21 tall antenna towers on 346 acres, using four 100 kW shortwave transmitters for broadcasts from 6-21 MHz), or VOA Greenville, NC (28,000 acres, with 300-foot towers supporting curtain arrays, two 500kW, four 250 kW shortwave transmitters targeting Latin America, Cuba, the Caribbean and Africa).

By contrast, for an amateur radio SSB (single sideband voice) signal, a typical receiver bandwidth would be 2400 Hz. A 40 dB/1-Hz SNR (that is, in a 1-Hz bandwidth) would be 40 dB - 10 log10 (2400/1) = 6 dB Hz SNR, in a 2400 Hz bandwidth. It is commonly recognized by communications engineers that a 10 dB SNR in a voice bandwidth (that is, 2400 Hz) yields comfortable copy of a signal by trained operators. A 6 dB SNR in a 2400 Hz bandwidth would yield copy with "annoying" noise, but it would still be readable by trained, persistent operators.

The Taormina project is aimed at yielding copy with "annoying" noise, readable by trained, persistent operators, 57% of the time, or four days out of seven.

In contrast to VOA Greenville, Taormina seeks only a goal of 57% reliability (seen as REL on the graphs included in the Taormina Needs Analysis) at a 40 dB/1-Hz SNR, to his desired coverage areas, using a maximum of 1500 watts, a difference of 498,500 watts.

Taormina does not seek "the same quality of communications that the Voice of America strives for in its short wave broadcasts."

To repeat: The difference between the VOA reliability goal (73 dB SNR/1-Hz) and the Taormina reliability goal (40 dB SNR/1-Hz) is 33 dB, or a factor of approximately 2000:1.

Additional sources:

Lane, G., "Signal-to-Noise Requirements for Speech Communication in Short Wave Broadcasting," Voice of America Technical Report ESBA-84-1, 14 p., July 1984.

Lane, G. and Toia M., July 31, 1985. "High Frequency (Shortwave) Broadcast System Design; Requirements Definition", Voice of America Engineering Standard 16775.01, Washington DC USA.

Lane, G., A. B. Richardson, and L. M. DeBlasio, "Signal-to-Noise Ratio and Aural Assessment of Broadcast Reception Quality," IEE 6th International Conference on HF Radio Systems and Techniques (Univ. of York, York, UK), IEE Conference Publication No. 392, 129 - 133, July 4 - 7, 1994.