

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Office of Engineering and Technology) ET Docket No. 10-123
Request for Information on Use of)
1675-1710 MHz Band)

**COMMENTS OF THE
NATIONAL ACADEMY OF SCIENCES'
COMMITTEE ON RADIO FREQUENCIES**

The National Academy of Sciences, through the National Research Council's Committee on Radio Frequencies (hereinafter, CORF¹), hereby submits these comments in response to the Commission's June 4, 2010, Public Notice in the above-captioned docket (ET 10-123) seeking comments on the use of the 1675-1710 MHz band. CORF has a substantial interest in the spectrum issues raised in this proceeding, because CORF represents the interests of the scientific users of the radio spectrum, including users of the Meteorological Aids Service, the Meteorological Satellite Service (MSS), and the Earth Exploration Satellite Service (EESS) bands, as well as users of the Radio Astronomy Service (RAS) bands. These observers perform extremely important yet vulnerable observations and provide data of national importance. Herein, CORF briefly notes the importance of protecting the scientific users of the 1675-1710 MHz band from interference, as well as protecting RAS users in the neighboring 1660-1670 MHz band from out-of-band interference. Whether the distribution of information currently available from the MSS which is received at only a few receive-only (RO) sites

¹ A roster of the committee members is attached.

and distributed via terrestrial services would be a functionally equivalent substitute for distribution of the information received directly from the satellite and radiosonde services is specifically addressed as well.

The 1675-1710 MHz space-to-Earth MSS band is used to provide, via direct broadcast and direct readout, critical weather information and forecast data to NOAA and other federal agencies as well as non-federal users in the United States and internationally. (The band is utilized not only by U.S. space assets, but also by weather satellites from Europe and China.) A critically important use of this band is to provide timely and freely available public-domain weather satellite imagery to facilitate public safety during all phases of an environmental emergency—from warnings to disaster relief. RO ground stations are utilized by local municipalities, as well as county and state governments to receive imagery, which is then used to warn the public and manage emergency response.² Because of the 10-20 year life cycle of the Geostationary Operational Environmental Satellites (GOES), reallocation of this spectrum could jeopardize this important public safety mission during times of weather emergencies.

Additionally, this band is used for data telemetry from radiosondes (weather balloons). NOAA launches more than 75,000 radiosondes per year at more than 90 sites in the United States.³ The data collected provide critical information for weather forecasting and for monitoring current conditions, including potential threats to aviation caused by wind shear and microbursts. Universities (usually during research

² See “NOAA Emergency Managers Weather Information Network,” available at <http://www.nws.noaa.gov/emwin/>.

³ See, e.g., “NOAA National Weather Service Radiosonde Observations,” available at <http://www.ua.nws.noaa.gov/factsheet.htm>.

campaigns) and other non-federal organizations also use radiosondes for atmospheric research.⁴

CORF appreciates the desire to improve spectrum usage efficiency and recognizes the potential for protection of a few isolated ground stations to allow the spectrum to be shared. However, CORF points out that the 1675-1710 MHz spectrum is not being used lightly. Several GOES satellites transmit 100 percent of the time imagery that is available to anyone operating an RO ground station. The passive nature of the RO terminals allows an unlimited number to be used without risk of interference to other users. Thus, such passive use is not only use, but also efficient use, of the spectrum. Accordingly, the Commission should take care to balance the expanded use of the spectrum with system stability and needs related to public safety, especially during times of emergency.

Distribution of important environmental information by terrestrial services can be compromised by adverse events during disasters and emergencies when the information is most critical. However, distribution by satellite downlink, especially in the L-band, which is largely immune to weather events, is robust even when terrestrial communications networks are down. Therefore, the distribution of information currently available from the MSS which is received at only a few receive sites and then distributed via terrestrial services would not be a functionally equivalent substitute for

⁴ The National Center for Atmospheric Research Earth Observing Laboratory (EOL) in Boulder, Colorado, operates the GPS Advanced Upper-Air Sounding System (GAUS) for many universities during a number of field experiments around the world each year. See <http://www.eol.ucar.edu/instrumentation/sounding/gaus/gps-advanced-upper-air-sounding-system>. NCAR is sponsored by the National Science Foundation but is managed by the University Corporation for Atmospheric Research. UCAR is a nonprofit consortium of North American member universities, each of which grants doctoral degrees in the atmospheric and related sciences.

the distribution of information acquired through the direct reception of the satellite and radiosonde services during a time of emergency.

The potential for unintended harmful interference from mobile broadband devices to even remote RO ground stations is not insignificant. By their very nature, mobile devices know no geographical boundaries, because they are transported by their users. If this band becomes shared with mobile broadband users, geography-based interlocks utilizing GPS technology should be seriously considered as a means to protect RO stations from mobile broadband devices utilizing this band. In crafting rules for commercial wireless use of this band, the Commission should consider a requirement that information regarding registered ROs is dynamically updated within the mobile devices to avoid interference as new stations come online and to provide additional spectrum sharing as stations go offline.

CORF also notes the need to be mindful of protecting radio astronomy in the neighboring 1660-1670 MHz band from out-of-band emissions (OOBE) from commercial wireless operations in the 1675-1710 MHz band.⁵ The band at 1660-1670 MHz is a very important radio astronomy band used to observe maser emissions from the hydroxyl radical (OH) in stars' atmospheres—key to investigating the physical phenomena associated with the formation of protostars and the initial stages of star formation, as well as the evolution of, and magnetic fields in, galaxies.⁶

OOBE can be very harmful to radio astronomy observations. Thus, in crafting rules for commercial wireless use of the 1675-1710 MHz band, the Commission should

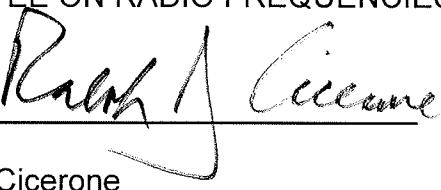
⁵ The Radio Astronomy Service has the primary allocation in the 1660-1670 MHz band.

⁶ National Research Council, *Spectrum Management for Science in the 21st Century*, The National Academies Press, Washington, D.C., 2010, p. 118.

enact specific OOBE limits, such as those in Sections 22.359 and 22.917 of the Commission's rules.

Respectfully submitted,

NATIONAL ACADEMY OF SCIENCES'
COMMITTEE ON RADIO FREQUENCIES

By: 

Ralph Cicerone
President, National Academy of Sciences

August 12, 2010

Direct correspondence to:

CORF
Keck Center of the National Academies
500 Fifth St., NW, Room 954
Washington, DC 20001
(202) 334-3520

Attachment

CORF Membership List:

Jeffrey Piepmeier, *Chair*, NASA Goddard Space Flight Center

Ana P. Barros, Duke University

Steven W. Ellingson, Virginia Tech

Kenneth Kellermann, National Radio Astronomy Observatory

David G. Long, Brigham Young University

Darren McKague, University of Michigan

James M. Moran, Harvard-Smithsonian Center for Astrophysics

Melinda Piket-May, University of Colorado at Boulder

Alan E.E. Rogers, Massachusetts Institute of Technology/Haystack Observatory

Steven C. Reising, Colorado State University

Liese van Zee, Indiana University

Lucy Ziurys, University of Arizona

Michael Davis, *Consultant*

Paul Feldman, Fletcher, Heald, and Hildreth, *Consultant*

A. Richard Thompson, National Radio Astronomy Observatory, *Consultant*