Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands	)	**ET Docket No. 03-237**

TO: The Commission

COMMENTS OF XCEL ENERGY SERVICES, INC.

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EXECUTIVE SUMMARY

The issuance of a Notice of Proposed Rulemaking seeking to implement the interference temperature concept at 6 GHz is utterly premature and potentially dangerous. As illustrated by the NOI, there are very basic, fundamental questions regarding the viability of an interference temperature metric as a theory, and to seek to implement an incomplete theory is irresponsible, arbitrary and capricious. At the very least, the FCC must delay any action on the NPRM in this docket until the completion of the NOI in order to provide the Commission and commenting parties with all the facts before rushing into the implementation phase.

In the FCC's rush to implement, the Commission has also made several critical oversights that must be rectified. Specifically, in any interference discussion, the nature of the licensee and the use supported must be considered. Critical infrastructure licensees at 6 GHz rely on their microwave operations to support the safe, efficient, and reliable operation of the Nation's power grid. The public can ill-afford interference to these systems, and the potential disruption that such interference can cause to the electric system.

Moreover, many of these licensees have already been relocated once in connection with the FCC's band clearing efforts at 2 GHz to accommodate emerging technologies. After relocating and fine-tuning their systems, these licensees now face the new threat of interference from transient, un-locatable unlicensed devices. This is inappropriate and should not be permitted. Accordingly, Xcel Energy urges the Commission to delay its NPRM until such time as the NOI has been completed in order to allow full and intelligent comment on the part of those affected parties.

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I. INTRODUCTION

Pursuant to Section 1.415 of the FCC's Rules,[1] Xcel Energy Services, Inc. ("Xcel Energy") hereby submits its Comments in the above-captioned proceeding in response to the Federal Communications Commission's ("FCC's" or "Commission's") Notice of Proposed Rulemaking ("NPRM") in ET Docket No. 03-237.[2] For the reasons discussed herein, Xcel urges

[1] 47 C.F.R. § 1.415.

[2] *In re Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, ET Docket No. 03-237, 18 FCC Rcd 25309 (Nov. 28, 2003); 69 Fed. Reg. 2863 (Jan. 21, 2004) (establishing Comment deadline as April 5, 2004, and Reply Comment Deadline as May 5, 2004) (hereinafter, because of the bifurcation of this item, paragraphs 1 to 28 will be referred to as the NOI, while paragraph 28 to the end will be referred to as the NPRM).

the Commission to rescind or delay its NPRM until it has completed its Notice of Inquiry ("NOI") into the necessity and usefulness of the interference temperature concept, and to revisit this issue and/or provide additional opportunity to comment once the NOI has been completed.

Xcel Energy Services, Inc. through its affiliated operating companies – Northern States Power Company, Northern States Power Company-Wisconsin, Public Service Company of Colorado, Cheyenne Light Fuel & Power Company, and Southwestern Public Service Company - generates, transmits and distributes electricity and distributes natural gas to its customers. Xcel Energy is the fourth-largest combination electricity and natural gas energy company in the United States. Xcel Energy offers a comprehensive portfolio of energy-related products and services to 3.2 million electricity customers and 1.7 million natural gas customers. Xcel Energy has regulated operations in 11 Western and Midwestern states including large portions of Colorado, Minnesota and Wisconsin, as well as portions of Kansas, Michigan, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming. Xcel Energy owns over 240,000 conductor miles of electricity transmission and distribution lines, and more than 32,700 miles of natural gas pipelines. Xcel Energy operates more than 70 power plants that generate about 15,246 megawatts of electric power.

Xcel Energy has the complex task of providing energy to its customers under challenging circumstances. In particular, Xcel Energy provides service during the severe weather common to the winter in Minnesota, Wisconsin, Colorado, North and South Dakota and Wyoming. To facilitate its internal communications and monitoring of its power generation and distribution system, Xcel Energy operates an extensive private radio communications system, including a significant number of point-to-point microwave systems in the 6 GHz band. Xcel holds 112 microwave licenses in the 6 GHz band, 41 of which would be directly affected by the current

NPRM. Xcel Energy utilizes this spectrum for protective relaying, SCADA circuits, control of its two-way radio network, voice communications, controlling its extensive distribution and transmission system, relay of alarm signals, and power plant control. These microwave links form a vital backbone of Xcel's communications infrastructure, and should not be subject to an "experiment" in interference management with only the unproven promise that interference is not likely.

Xcel Energy's radio communication system and its 6 GHz operations are essential to Xcel Energy's ability to maintain continuous service to its customers while simultaneously assuring the safety of its crews working on high voltage and other potentially dangerous equipment and the public at large. Xcel Energy's microwave system is a significant part of its overall communications system, and Xcel believes that its integrity may be jeopardized by the FCC's rush to implement an untried, untested interference management theory in the 6 GHz band. Xcel Energy therefore urges the Commission to rescind or delay the resolution of the NPRM until the NOI is completed, and to reassess the necessity and viability of using 6 GHz as a test bed for this experimental concept at that time. Should the Commission then choose to proceed, Xcel Energy urges the FCC to solicit more informed comments at that time based on the information, record, and conclusions it is able to glean in the NOI.

II. A NOTICE OF PROPOSED RULEMAKING ON INTERFERENCE TEMPERATURE IS PREMATURE

A. The NOI Renders the NPRM Imprudent and Counterproductive

In his separate statement accompanying the FCC's NOI and NPRM, Commissioner Jonathan Adelstein questioned the legitimacy of issuing an NPRM while the fundamental aspects of the interference temperature theory are still being explored. Commissioner Adelstein stated bluntly that he "do[es] not believe that this portion of the item should be styled as a Notice of

Proposed Rule Making, as opposed to remaining part of the Notice of Inquiry." Further, Commissioner Adelstein asserted that "it is very clear that we are exploring an entirely new concept in the interference temperature model, and it is quite premature to actually discuss proposed rules when the Commission has not even engaged in a preliminary discussion on the interference temperature approach as a whole."[3] The licensees at 6 GHz and 12 GHz "deserve better," in his words. Xcel Energy strongly concurs with this assessment.

1. Underlying Issues Must be Resolved Prior to Any Implementation of the Interference Temperature Metric

The NOI seeks comment on a number of *fundamental* issues that render an NPRM in this instance incurably premature. For example, the FCC has requested input in the NOI on whether or not the interference temperature approach is even *necessary*.[4] In fact, the ongoing NOI makes it clear that the interference temperature is still being evaluated as to its viability in *theory*, let alone its viability in practice. The NOI also seeks comment on a variety of legal and technical issues of such an essential nature that proceeding with an NPRM is arbitrary and capricious in the absence of a resolution to the NOI.

For example, the NOI seeks comment generally on "the technological factors" that should be considered in setting an interference temperature limit.[5] This is a particularly

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[3] Separate Statement of Commissioner Jonathan S. Adelstein Approving in Part, Concurring in Part, *In re Establishment of an Interference Temperature Metric to Quantify and Mange Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile, and Satellite Frequency Bands,* ET Docket No. 03-237, Notice of Inquiry and Notice of Proposed Rulemaking, FCC 03-289 (rel. Nov. 28, 2003).

[4] NOI at ¶ 8 ("We seek comment on whether it would be necessary to shift our current paradigm for assessing interference from approaches based primarily on transmitter operations towards new approaches that focus on the actual RF environment and interaction between transmitters and receivers…").

[5] NOI at ¶ 21.

fundamental question, as parties have previously noted that the interference temperature approach "presents many difficult technical problems"[6] and that the concept is "fraught with difficulty."[7] The NOI also asks the basic question of how the interference temperature concept will change the legal framework, regulatory process and enforcement of rules designed to prevent harmful interference.[8] It inquires into what entities should be parties to the process of setting an interference temperature limit, as well how to fund a monitoring system and who would be responsible for their establishment, operation and maintenance.[9] As Motorola noted in its initial comments on the SPTF Report, this "fundamental task of determining and controlling the influence of a transmitter's emissions upon a remotely located receiver is an enormously complex problem."[10] Enforcement issues also abound, as the NOI seeks comment on how to determine which devices will be affected and the priority for resolving a situation where the interference temperature has been exceeded.

There are a number of substantial technical hurdles that must be overcome "before the potential benefits of the interference temperature concept can be realized."[11] As those in the trenches have noted, the interference temperature metric "is a long way from being ready for routine deployment in the real world as a reliable spectrum tool."[12] Further analysis and study of the concept is an absolute necessary before implementation.

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[6] Comments of Motorola, Inc., *In re Spectrum Policy Task Force Report*, ET Docket No. 02-135 (filed Jan. 27, 2003) ("SPTF Proceeding").

[7] *Id.* at 14.

[8] NOI at ¶ 17.

[9] NOI at ¶¶ 21-22.

[10] *Id.*

[11] *Id.*

[12] *Id.*

2. In the Absence of Completion of the NOI, the NPRM is Incurably Premature and in Violation of the Administrative Procedure Act

The issuance of an NPRM seeking to implement this theory while still questioning its legitimacy and necessity deprives parties a meaningful opportunity to comment on this issue in the NPRM in violation of section 553 of the Administrative Procedure Act.[13] That is, the NOI illustrates the developmental nature of the interference temperature theory. The NPRM, therefore, is inadequately formed and possesses few concrete proposals upon which intelligent comment can be made. At the very least, the FCC must conclude the NOI portion of the docket before it acts on the NPRM in order to preserve the opportunity for meaningful comment by parties and for the FCC to fully evaluate the necessity of the interference temperature concept both generally and specifically in the 6 GHz and 12 GHz band.

B. The NOI Should Be Concluded Prior To Implementation In Any Band

The FCC has recognized that measuring and monitoring the noise floor is "a substantial, time consuming, and …resource intensive undertaking."[14] Despite this admission, however, the FCC has, through its NPRM, committed the FCC and those licensees in the 6 and 12 GHz bands to engage in a full scale "experiment." It is inappropriate, arbitrary and capricious, however, to impose these costs and burdens for speculative gain. This is particularly true given that the FCC, by virtue of its NOI, has conceded that the interference temperature metric is not yet sufficiently developed.

Without answers to the fundamental queries posed by the NOI, the questions in the NPRM are ungrounded, speculative and meaningless. Because these theoretical issues have not

[13] 5 U.S.C. § 553.

[14] NOI at ¶ 26.

been resolved or even more adequately framed, it is virtually impossible to comment intelligently in the NPRM on the impact that the interference temperature metric would have on the 6 GHz band. The NOI must be concluded, and the theoretical issues resolved, before any meaningful discussion can ensue with respect to practical implementation. Accordingly, Xcel Energy respectfully requests that the Commission conclude its NOI prior to considering an NPRM on this issue.

III. THE 6 GHZ BAND SHOULD NOT BE A "TEST BED" FOR THE INTERFERENCE TEMPERATURE CONCEPT

In any event, the Commission's choice of a testing ground for its incomplete theories is inappropriate and dangerous for several reasons. First, in choosing the 6 GHz band, the FCC failed to take into account the nature of the licensees in the band, and the manner in which these licensees utilize their licensed spectrum to support services essential to all Americans. Second, the FCC failed to consider its recent relocation efforts in the 2 GHz band, and the spectrum comparability promised to those relocating from 2 GHz to higher bands including 6 GHz and 12 GHz. The FCC, therefore, should reconsider its determination to "experiment" in the 6 GHz and 12 GHz bands.

A. The Character Of The Operations In A Band Must be Considered In Determining When or If To Implement Any New Interference Management Mechanisms

1. Xcel Energy's communications systems support vital utility functions that must not be subjected to increased interference

Private users need the certainty of licensed spectrum, and the ability to identify authorized users in the event of interference.[15] This is particularly true for utilities that employ their spectrum in support of vital utility functions. Utility microwave systems in the 6 GHz band and elsewhere are employed to carry multiple address telemetry applications, point-to-point microwave for data and voice communications, and special applications such as control of electric power and natural gas SCADA networks.[16] As modern utility systems have increased in complexity, these systems, and particularly SCADA systems, have become critical components of the utility command and control infrastructure.[17] Moreover, these systems help to automate tasks like opening and closing circuit breakers, monitoring system stability, and monitoring alarms for overload conditions. Direct radio control of remote substations, gas compressor stations, and pole top switches also aids in prompt customer service and restoration of service.[18]

The proposed interference temperature model, however, creates substantial uncertainty regarding the protections against harmful interference, and would degrade the performance of currently deployed systems.[19] These are consequences that can ill be afforded in today's climate of heightened security and the increased reliance of modern life on the consistent, reliable availability of electricity. This is not the place the "experiment" with unlicensed devices.

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[15] *See generally,* Blooston Private Users' Reply Comments, SPTF Proceeding, 02-135 (filed Feb. 28, 2003).

[16] Marshall W. Ross & Jeng F. Mao, *Current and Future Spectrum Use by the Energy, Water & Railroad Industries,* NTIA, at 3-7, 3-10 (Jan. 2002).

[17] *Id.*

[18] *Id.*

[19] Lockheed Martin Comments, SPTF Proceeding, at 7 (filed Jan. 27, 2003).

2. Xcel Energy's operations would be adversely impacted by the implementation of the proposals in the NPRM

Commenters in the SPTF proceeding have noted a variety of harmful consequences that would likely result from the institution of an interference temperature cap. For example, Lockheed Martin noted that "…licensees would be required needlessly to spend greater economic resources on future systems to accommodate the increased power requirements for achieving the desired signal-to-noise-ratio."[20] In today's national security climate, critical infrastructure entities should not be required expend a substantial amount of resources policing their spectrum to prevent harmful interference from unlicensed devices pushing the envelope with respect to the noise floor. Their communications systems should not be required to endure degradation in this manner.

Some of the most serious inadequacies in the FCC's proposals arise in terms of enforcing and remedying harmful interference resulting from a sanctioned increase in the noise floor. Commenters have already noted that the "[Spectrum Policy] Task Force's proposal avoids the fundamental question of how the Commission will police harmful interference,"[21] and the NPRM is similarly devoid of any concrete proposal to address this issue. Moreover, "[i]t is unclear that, as a practical matter, an entire category of unlicensed users can be identified and then made to remedy, as a group, the fact that the interference temperature was exceeded."[22] It would also be "difficult to identify when, where and by whom a particular interference

[20] *Id.* at 8.

[21] *Id.* at 7.

[22] *Id.* at 7.

temperature limit was violated…" resulting in an "untenable enforcement situation."[23] This cannot be countenanced, particularly in a band in which interference-free operations are crucial to the provision of safe and efficient electric power.

B. It Is Arbitrary and Capricious To Further Encumber Spectrum Provided to Relocated 2 GHz Microwave Systems

A number of 6 GHz licensees, including Xcel Energy, were previously licensed to use spectrum in the 2 GHz band for point-to-point microwave and were compelled to relocate to 6 GHz in order to clear spectrum for "emerging technologies," including PCS.[24] Xcel Energy has relocated approximately two dozen 2 GHz paths to the 6 GHz band, and would like to ultimately transition a number of additional 2 GHz paths to the 6 GHz band in light of the impending deadline by which all remaining 2 GHz microwave paths will be relegated to secondary status. The pending NPRM, however, has cast a shadow over the viability of the 6 GHz option for these vital communications links. Although 6 GHz is attractive as a new location for some of its operations, Xcel Energy cannot risk the possibility of interference from unlicensed devices threatened by the FCC's premature action in issuing this NPRM without the necessary facts that remain outstanding in the NOI.

Throughout the 2 GHz relocation proceeding, the FCC recognized "the essential functions, such as public safety and utility management communications, that 2 GHz fixed

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[23] Comments of Arch Wireless Operating Company, Inc., SPTF Proceeding, at 4 (filed Jan. 27, 2003).

[24] *See generally, In re Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, ET Docket No. 92-9, RM-8004.

microwave operations now provide…"[25] The Commission took note of the importance of the functions these licenses supported, and enacted various rules to help to ensure the uninterrupted continuance of their operations and to "minimize the impact of our spectrum redevelopment plan on those services."[26] These essential microwave links employed to manage and protect this Nation's electric power grid, however, are now slated to be the first subject to an experimental concept that could further encumber their operations and endanger the essential utility functions they support.

This is wholly inappropriate and ill-conceived. Licensees relocated from 2 GHz have invested innumerable hours and endured significant inconvenience to migrate their systems to the 6 GHz and other higher spectrum bands. They relocated in good faith, and with the assurance that the facilities and spectrum they received and accepted would be comparable to their former spectrum and facilities. Now, after fine-tuning their replacement systems and returning to the business of supporting their core electric business, the FCC has proposed to fundamentally alter the spectrum environment in which they have been re-established. The Commission should not compel these licensees to once again devote resources to defending their vital communications systems from interference, particularly when the Commission itself concedes, thought its NOI, that the interference temperature concept is still highly theoretical.

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[25] *See, In re Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, ET Docket No. 92-9, RM-7981, RM-8004, First Report and Order and Third Notice of Proposed Rulemaking, 7 FCC Rcd 6886, at ¶ 21 (Oct. 16, 1992).

[26] *Id.*

IV. CONCLUSION

For the foregoing reasons, Xcel Energy respectfully requests the Commission consider these comments and proceed in a manner consistent with the views expressed herein.

Respectfully submitted:

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