

Before the
Federal Communications Commission
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

MM Docket No. 99- _____
RM No. _____

In the matter of)
)
Indoor Sports and Entertainment Radio Service)
)
Amendment of Rules to Create New Radio Service)

To: Chief, Mass Media Bureau

PETITION FOR RULE MAKING

The NATIONAL HOCKEY LEAGUE ("NHL"), by its attorneys, herewith petitions for rule making and requests that the Commission amend its rules to create a new Indoor Sports and Entertainment Radio Service. In support of this petition for rule making, the NHL shows as follows.

1. The NHL is a joint venture of twenty-seven (27) [thirty (30) by the year 2000] member professional hockey clubs ("Member Clubs") organized as a not-for-profit unincorporated association. Twenty-one (21) [twenty-four (24) by the year 2000] of the Member Clubs are located in the United States.¹ Six (6) of the Member Clubs are located in Canada.

¹ The US Member Clubs are (or will be) located in the metropolitan areas of Anaheim, CA; Atlanta, GA; Boston, MA; Buffalo, NY; Chicago, IL; Columbus, OH; Dallas, TX; Denver, CO; Detroit, MI; Los Angeles, CA; Miami, FL; New York, NY; Nashville, TN; Northern New Jersey; Long Island, NY (Nassau/Suffolk Counties); Philadelphia, PA; Phoenix, AZ; Pittsburgh, PA; Raleigh, NC (for the 1999-2000 season and beyond; Greensboro, NC for the 1998-99 season); St. Louis, MO; St. Paul, MN; San Jose, CA; Tampa, FL, and Washington, DC. Atlanta, Columbus and St. Paul will begin play over the next two seasons. The arenas, in some cases, may be physically located in nearby communities other than the above-named cities. Attachment 1 contains more detailed information for each US Member Club arena, including seating capacity.

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List A B C D E

2. The US Member Clubs generally play regular season and playoff NHL home games in indoor arenas located in the United States.² Those arenas have seating capacities of between 15,000 and 21,000 persons, with an average seating capacity in excess of 18,000 persons per arena. During a typical NHL hockey season, starting in September, each Member Club might play ten (10) pre-season NHL games and eighty-two (82) regular season NHL games, followed by Stanley Cup Playoff games. The NHL season usually ends in June with the four (4) to seven (7) game Stanley Cup Finals series. Stated another way, a Member Club might play in excess of one hundred (100) NHL games in a typical season. Total Attendance for the NHL Regular Season and Playoff games is just under 19,000,000 persons.³

3. For the hockey fan, his or her visit to the NHL game may last between three (3) and four (4) hours in the arena, excluding commuting time to and from the game. The NHL has observed that some of the fans in some NHL markets are relatively new to the game of hockey. Those new fans are in the process of learning about the game, its rules, its players, its history and its traditions. Furthermore, given the increasing price of tickets and the costs associated with attending a game, the NHL has also observed generally that whereas a season ticket formerly represented one person attending all of the NHL home games, today a season ticket represents several different persons who split the NHL games and share the cost of the ticket. Regular season attendance of NHL games at any given

² In addition, exhibition and tournament games are played at various indoor arenas throughout the world. The NHL also conducts various other events, such as the annual NHL Entry Draft in June, in an indoor arena.

³ *The NATIONAL HOCKEY LEAGUE Official Guide & Record Book 1998-99*, p 10.

arena may approach 1,000,000 persons, reflecting about 250,000 different persons attending NHL games at that arena over the course of a season, and therefore about 5,000,000 different persons nationwide.

4. These hockey fans currently have no radio service addressed to them in the arena to enhance their viewing experience at the games. The signals of the radio and TV stations that have been granted the rights to broadcast the NHL games typically do not penetrate the arena at all, or at best very poorly. Furthermore, those radio and TV broadcasts are not oriented to the needs and interests of the seated fan at the NHL game, but to a listener or viewer located outside, and perhaps some distance from, the arena.

5. The NHL has observed that for some of its fans in some of the NHL markets English is not their first language. Many of the NHL's fans have no access to radio broadcast game coverage in their first languages. Additionally, no radio service is currently available to fans attending the games to: (i) explain the calls of the referees and the rules of hockey; (ii) to provide information about services inside or near the arena; (iii) to provide entertainment before the NHL game, between periods and after the game; (iv) to provide transportation directions and information before they leave the arena, or (v) to provide emergency information. Furthermore, persons with visual and hearing impairments currently have no radio services directed to their particular information needs at NHL games.

6. The NHL submits that an Indoor Sports and Entertainment Radio Service transmitting on several channels inside the hockey arena would significantly enhance the experience of the millions of US citizens who attend NHL games each year (representing

multiple millions of listening hours). These persons currently have no radio broadcast services directed to their unique needs and interests.

7. To test the viability of this concept, the NHL applied to the FCC for and obtained an experimental authorization (WN2XHL) to undertake indoor radio broadcasts at NHL arenas. The NHL wanted to test transmission technology and design to contain a broadcast signal within the arena, to measure the interest of hockey fans in a unique radio program service, and to show for the first time that indoor sports broadcasting represents a tremendously popular value-added service for persons attending NHL games each season. The NHL undertook pioneering experimental indoor radio broadcasts during the Stanley Cup Playoffs held in June, 1998. A detailed *Report of the NATIONAL HOCKEY LEAGUE* (“*NHL Report*”) was submitted to the Commission on September 1, 1998, providing the first documentation addressing the feasibility and value of this new type of radio service. A complete copy of the *NHL Report* is appended hereto as Attachment 2.

8. The *NHL Report* proves that an Indoor Sports and Entertainment Radio Service, operating on multiple channels, will significantly enhance the experience of the NHL game for a very large number of Americans. The *NHL Report* reveals that an Indoor Sports and Entertainment Radio Service can be designed and managed so as to deliver the radio broadcast signals to the fans in the hockey arena without producing undesirable interference to full-service radio broadcast stations on adjacent frequencies inside or outside the building.

9. The *NHL Report* indicates that power is *not* the most significant issue, contrary to the conventional thinking about certain new radio concepts, which have tended

to focus on low power levels. The NHL conducted measurements that demonstrate that a satisfactory power level can easily be established, which provides a quality signal indoors, but which does not produce measurable readings directly outside the building. While that power level could vary from building to building, in the experimental broadcasts 1.5 to 2 Watts of power were sufficient to contain the radio broadcast signal within the two NHL arenas in question, while providing excellent reception in the bowl of the arena. Slightly higher power levels might improve signal quality elsewhere in the building, with more precise tuning efforts. The NHL has contacted equipment vendors about manufacturing transmitters whose power levels (a) could be set with greater precision and (b) could be capped at certain low fixed levels, such as 3, 5, 7 or 10 Watts

10. The *NHL Report* concludes, based on the experimentation undertaken, that antenna design, placement and shielding are more critical factors than power. These factors would likely have greater impact on signal propagation than raw power. If transmission facilities were installed on a permanent basis for use during a full season of NHL games, considerably greater effort would be devoted to the various antenna factors than would be devoted to power.

11. Finally, and most importantly, the *NHL Report* demonstrates meaningful support from the public for an Indoor Sports and Entertainment Radio Service. Specifically, the NHL had a very high response rate to its listener survey during the fourth experimental broadcast. Furthermore, those respondents gave overwhelmingly positive responses. Based in part on the strength of these listener results, as well as the strong

interest from some Member Clubs, the NHL concluded that it should file this petition for rule making.

12. Two important issues for the rulemaking proceeding are: (a) mutual exclusivity of users or uses and (b) licensing. After studying the *NHL Report* and the nature of the experimental operations, the NHL submits that neither of these issues impede the creation of an Indoor Sports and Entertainment Radio Service.

13. Because access to the building is controlled by either the NHL, a Member Club or the owner of the arena, it is not possible to have more than one Indoor Sports or Entertainment Radio operator at any NHL game. Furthermore, the operation of an Indoor Sports and Entertainment Radio Service station on several channels inside an NHL arena will not preclude the operation of an Indoor Sports and Entertainment Radio Service station at some other venue in the same general area, because the signals at issue will be designed to stay within each building.

14. Accordingly, the NHL does not envision any situation where there could be mutually exclusive requests for facilities. Therefore, the competitive bidding provisions of Section 309(j) of the Communications Act would not apply. For these same reasons, there would appear to be no reason to impose any ownership restrictions or limitations of any nature on Indoor Sports and Entertainment Radio Service licenses, other than the alien ownership restrictions contained in Section 310(b) of the Communications Act.

15. The NHL recognizes that the FCC has fixed resources and that its many responsibilities place great demands on those resources. The public interest would not be well served by the creation of any new radio service that would unduly strain those fixed

resources. For that reason, the NHL recommends that the FCC implement an abbreviated or streamlined licensing system for the proposed indoor sports radio service. Based on the NHL's experience with the experimental broadcasts, the NHL urges and will work with the FCC to fix the limits and parameters of operation, by rule, policy statement or some other mechanism, and will utilize self-enforcing mechanisms to minimize FCC oversight.

16. Inasmuch as the proposed Indoor Sports and Entertainment Radio Service seeks to operate in the conventional radio broadcast spectrum – in great part because of the desirability of using inexpensive conventional radio receivers and proven inexpensive transmission equipment – the NHL submits that a streamlined or abbreviated licensing system, rather than a completely unlicensed system, provides a better mechanism to enforce protection of full-service broadcast stations and to monitor precisely who is providing what service at any given location.⁴ The NHL suggests that the core elements of an abbreviated licensing system include: (a) providing advance notice to the FCC of the precise location and the specific frequencies of the proposed new or modified operation; (b) the filing of measurements with the Commission – like those contained in the *NHL Report* – that prove containment of the signal within the structure, and (c) renewability of the license.

17. The NHL suggests that measurements be undertaken before the commencement of regular program service and thereafter on an on-going basis, for example at the beginning of each season, to demonstrate containment of the signal, which is defined as no measurable signal outside the building at designated monitoring points

⁴ The use of four-letter broadcast root call signs could facilitate the monitoring process by broadcasters and the public, as well as the marketing of the program service.

located within 100 yards of the building. A “proof of performance” could be filed with the Commission annually or biennially. Among other things, it would include equipment specifications and transmitter output power. The Indoor Sports and Entertainment Radio Service operator could also be required to serve affected full-service radio stations with copies of these documents, if the Commission believes such notice would facilitate satisfaction of broadcasters’ concerns about potential interference. Of course, Indoor Sports and Entertainment Radio stations would also be subject to FCC inspection.

18. The Commission has previously invited public comment on a variety of proposals for low power radio operations (RM-9208, 9242 and 9246). On April 27, 1998, the NHL filed Comments in response to the FCC’s public notice. Furthermore, the Commission adopted on January 28, 1999, a Notice of Proposed Rule Making in MM Docket No. 99-25, *Creation of a Low Power Radio Service*, FCC 99-6 (Released February 3, 1999), proposing the creation of a licensed low power FM radio service. The instant petition for rule making differs in significant respects from these proposals. The essence of the NHL’s current proposal is confinement of the radio broadcast signal within a building. While the content of the program service may be geared to a particular type of event – hockey games – the fact that the broadcast signal remains indoors more critically defines the proposed radio service rather than the event itself.

19. The NHL has also proposed to limit the proposed new radio service to “sports and entertainment” activities as another means of controlling the potential for interference. Both sports and entertainment businesses have a vested interest in properly constructing and operating indoor radio broadcast operations that do not create

interference with outside broadcasting.

20. The NHL envisions the Indoor Sports and Entertainment Radio Service as a commercially supported operation. Given the low power and contained nature of the service there should be no programming service obligations on Indoor Sports and Entertainment Radio Service licensees.

20. Finally, the NHL submits that the Indoor Sports and Entertainment Radio Service is highly suited for digital signal transmission technology. The ability to manipulate digital signals offers the ability to control and contain the signal. Although the FCC has not yet adopted a digital radio standard, the NHL urges the Commission to authorize on a primary basis digital signal transmissions in the Indoor Sports and Entertainment Radio Service at the earliest opportunity.

WHEREFORE, the NHL requests that the Commission initiate a rulemaking proceeding to create the Indoor Sports and Entertainment Radio Service.

Respectfully Submitted,

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The NATIONAL HOCKEY LEAGUE

By Harold K. McCombs, Jr.
Harold K. McCombs, Jr.

April 2, 1999

Attachment 1

US Member Clubs (arena capacity) as of March, 1999

1. Mighty Ducks of Anaheim (17,174)

Arrowhead Pond
2695 Katella Avenue
Anaheim, California 92803
2. Atlanta Thrashers (1999-2000 Season; arena under construction)

Business Office:
One CNN Center
13th South Tower
Atlanta, Georgia 30303
3. Boston Bruins (17,565)

FleetCenter
One FleetCenter
Boston, Massachusetts 02114-1303
4. Buffalo Sabres (18,595)

Marine Midland Arena
One Seymour H. Knox III Plaza
Buffalo, New York 14203
5. Carolina Hurricanes (TBA) (new arena under construction for 1999-2000 season)

Greensboro Coliseum (temporary)
1921 West Lee Street
Greensboro, North Carolina 27403

Business Office:
5000 Aerial Center Parkway; Suite 100
Morrisville, North Carolina 27560
6. Chicago Blackhawks (20,500)

United Center
1901 Madison Street
Chicago, Illinois 60612

7. Colorado Avalanche (16,061) (moving to new arena for 1999-2000 season)

McNichols Arena (old)
1635 Clay Street
Denver, Colorado 80204

8. Columbus Blue Jackets (2000-2001 Season)

Business Office:
150 E. Wilson Bridge Road
Suite 235
Worthington, Ohio 43085

9. Dallas Stars (16,928)

Reunion Arena
777 Sports Street
Dallas, Texas 75207

10. Detroit Red Wings (19,983)

Joe Louis Arena
600 Civic Center Drive
Detroit, Michigan 48226

11. Florida Panthers (19,200)

National Car Rental Center
One Panthers Parkway
Sunrise, Florida 33323

12. Los Angeles Kings (16,005) (moving to new arena for 1999-2000 season)

Great Western Forum (old)
3900 West Manchester Blvd.
Inglewood, California 90305

13. Minnesota Wild (2000-2001 Season)

Business Office:
Piper Jaffrey Plaza
444 Cedar Street
Suite 2000
St. Paul, Minnesota 55101

14. Nashville Predators (17,500)

Nashville Arena
501 Broadway
Nashville, Tennessee 37203

15. New Jersey Devils (19,040)

Continental Airlines Arena
50 Route 120 North
East Rutherford, New Jersey 07073

16. New York Islanders (16,297)

Nassau Veterans' Memorial Coliseum
1255 Hempstead Turnpike
Uniondale, New York 11553

17. New York Rangers (18,200)

Madison Square Garden
Four Penn Plaza
New York, New York 10001

18. Philadelphia Flyers (19,519)

First Union Center
3601 South Broad Street
Philadelphia, Pennsylvania 19148

19. Phoenix Coyotes (16,210)

America West Arena
201 East Jefferson Street
Phoenix, Arizona 85004

20. Pittsburgh Penguins (16,958)

Civic Arena
66 Mario Lemieux Place
Pittsburgh, Pennsylvania 15219

21. St. Louis Blues (19,260)

Kiel Center
1401 Clark Avenue
St. Louis, Missouri 63103-2709

22. San Jose Sharks (17,483)

San Jose Arena
525 West Santa Clara Street
San Jose, California 95113

23. Tampa Bay Lightning (19,758)

Ice Palace
401 Channelside Drive
Tampa, Florida 33602

24. Washington Capitals (19,740)

MCI Center
601 F Street, NW
Washington, D.C. 20004

Attachment 2

Report of The NATIONAL HOCKEY LEAGUE
September 1, 1998

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)
)
The NATIONAL HOCKEY LEAGUE) File No. BPEX-980526MD
Experimental Station WN2XHL)

To: Chief, Audio Services Division
Mass Media Bureau

REPORT OF THE NATIONAL HOCKEY LEAGUE

The NATIONAL HOCKEY LEAGUE ("NHL"), pursuant to the June 2, 1998, grant of its experimental station application BPEX-980526MD, submits this report as required by condition (c) of its authorization.

INTRODUCTION

On June 2, 1998, the Chief, Audio Services Division, Mass Media Bureau ("Chief") granted the NHL's application and specifically authorized the NHL to operate an experimental broadcast station with the call sign WN2XHL on 94.3 MHz, 99.9 MHz, and 104.7 MHz at the MCI Center in Washington, DC during the Stanley Cup Playoffs. The Chief imposed three conditions upon the authorization: (a) "the lack of objectionable interference to any other authorized domestic or foreign television, radio, or other communications services;" (b) operation at arenas other than the MCI Center required prior written authority from the Chief, after "submission of specific frequencies and the location coordinates for the particular arenas," and (c) the submission of a report, no later than September 1, 1998, detailing:

(i) the methodology employed and results obtained from the study to be conducted by the permittee to determine the interference effects of indoor arena event broadcasting and (ii) any conclusions made regarding the feasibility of indoor broadcasts including but not limited to effects of the building on sound quality and transmission system design; and (iii) other information requested by the Commission or considered pertinent by the permittee.

Attachment 1 contains a copy of the June 2, 1998, authorization.

On June 5, 1998, the Detroit Red Wings defeated the Dallas Stars in the Western Conference Finals earning the right to play the Washington Capitals in the Stanley Cup Finals. Pursuant to the June 2 authorization, the NHL thereafter applied to the Chief for additional authority to operate an experimental FM broadcast station for games played at Joe Louis Arena in Detroit, Michigan, during the Stanley Cup Finals. On June 10, 1998, the Chief granted the NHL's request and authorized operation of WN2XHL on 94.1 mHz, 96.7 mHz, and 107.9 mHz at Joe Louis Arena in Detroit, Michigan. Attachment 2 contains a copy of the June 10, 1998, authorization.

The NHL operated experimental FM broadcast station WN2XHL to show that indoor arena event broadcasting represents a tremendously popular value-added service for the approximately twenty million people attending NHL games each season. The results reported herein prove that an indoor arena event broadcast service will significantly enhance the event experience for a very large number of Americans. The results further reveal that the NHL can manage an indoor arena event broadcast at a power level and with a transmission system effectively designed to deliver the broadcast signals to the fans in the arena without producing undesirable interference to full-service stations on adjacent frequencies inside or outside the arena.

In providing the information requested by the Chief, this Report separates the four indoor arena event broadcast experiments conducted by the NHL during the 1998 Stanley Cup Playoffs. Each of the four experiments focused on a different aspect of conducting an indoor arena event broadcast and, together, they support the conclusion that the public positively approved and accepted such a service. The four experimental broadcasts (and Stanley Cup Playoff games involved) are as follows:

Experiment 1:

NHL Successfully Manages An Indoor Arena Event Broadcast

Tuesday, June 2, 1998
Game 5 of the Eastern Conference Finals
Washington Capitals and the Buffalo Sabres
MCI Center; 610 F Street, NW; Washington, DC
Approximately 8:00 PM to 11:00 PM EDT
94.3 mHz, 99.9 mHz and 104.7 mHz

Experiment 2:

Antenna Placement And Structure Of Joe Louis Arena Impact Indoor Event Broadcast

Thursday, June 11, 1998
Game 2 of the Stanley Cup Finals
Detroit Red Wings and the Washington Capitals
Joe Louis Arena; 600 Civic Center Drive; Detroit, Michigan
Approximately 8:00 PM to 12:00 AM EDT
94.1 mHz, 96.7 mHz and 107.9 mHz

Experiment 3:

NHL Field Measurements Support Previous MCI Center Results

Saturday, June 13, 1998
Game 3 of the Stanley Cup Finals
Washington Capitals and the Detroit Red Wings
MCI Center; 610 F Street, NW; Washington, DC
Approximately 8:00 PM to 11:00 PM EDT
94.3 mHz, 99.9 mHz and 104.7 mHz

Experiment 4:

Extraordinarily Positive Public Response To Indoor Event Broadcast At MCI Center

Tuesday, June 16, 1998

Game 4 of the Stanley Cup Finals

Washington Capitals and the Detroit Red Wings

MCI Center; 610 F Street, NW; Washington, DC

Approximately 8:00 PM to 12:00 AM EDT

94.3 mHz, 99.9 mHz and 104.7 mHz

I. METHODOLOGY EMPLOYED AND RESULTS OBTAINED

Experiment 1:

Tuesday June 2, 1998, Game 5 Of The Eastern Conference Finals Between The Washington Capitals And The Buffalo Sabres At The MCI Center, Washington, DC

The NHL conducted its first indoor arena event broadcast experiment during Game 5 of the Eastern Conference Finals between the Washington Capitals and the Buffalo Sabres at the MCI Center in Washington, DC, on Tuesday, June 2, 1998. Given the fortuitous opportunity of having an NHL Conference Finals game in Washington, DC and a few city blocks from FCC headquarters (and not knowing whether the Washington Capitals would advance to the Stanley Cup Finals), the NHL decided to conduct its first experimental indoor arena broadcast where FCC representatives could observe and monitor the experiment. This test allowed FCC representatives: (i) to examine the equipment used; (ii) to listen to indoor arena event broadcasts during an NHL game; (iii) to test, both inside and outside of the MCI Center, the strength and quality of the event broadcast signal, and (iv) to offer suggestions for the subsequent experiments during the Stanley Cup Finals.

The NHL operated on the three authorized FM frequencies (94.3 mHz, 99.9 mHz and 104.7 mHz) during this test. By using three frequencies the NHL could broadcast three different programs: (i) the ESPN television audio broadcast feed; (ii) the NHL Radio Network broadcast feed; and (iii) the Washington Capitals' radio broadcast on WTEM, Bethesda, Maryland.

The NHL mounted three Scala FM50N wideband antennas in the ceiling catwalk above the arena's seating area on west side of the arena. The antennas were mounted approximately five feet from each other and oriented in a different plane. Each antenna

transmitted one of the three broadcast signals identified in the previous paragraph. The NHL controlled the wattage and the three radio broadcast signals from the NHL Radio broadcast booth, located approximately 50 to 75 feet from the location of the three antennas. The NHL transmitted the three broadcast signals during the game at various power levels, never exceeding five (5) Watts.

NHL and FCC representatives used portable consumer-quality FM radio receivers with a headset to listen to the three radio broadcasts on their respective frequencies during the game. The portable radios allowed the NHL and FCC representatives to walk around the seating area, the concourse, and outside the building to observe the strength and quality of the three broadcast signals and the level of interference, if any, with adjacent frequencies.

Absent any scientific testing during this experiment, the NHL observed that five (5) Watts of transmitter power was more power than was necessary for good quality indoor reception. Furthermore, five (5) Watts of transmitter power produced an unwanted and unnecessary signal outside the MCI Center, albeit for short distances and with fading. Accordingly, the NHL experimented with reducing the transmitter power incrementally. The NHL ultimately observed that the three radio broadcast signals were clearly audible at 1.5 to 2 Watts in the seating area and most places within the MCI Center, including the press box and the concourse. At times, each of the three signals appeared to fade very minimally inside the arena, but such fading occurred primarily outside the seating area, especially on the east end of the arena (the area of the arena opposite and furthest from the location of the antennas). Most importantly, no noticeable interference with any adjacent radio frequency was detected inside the arena

Outside of the MCI Center, at 1.5 to 2.0 Watts, the three broadcast signals faded considerably (if not disappearing altogether) as one walked on the sidewalk immediately adjacent to, and around, the MCI Center. Moreover, no noticeable interference with any adjacent radio frequency was detected immediately outside the arena. However, the NHL observed that the MCI Center contains a number of windows from which one could see into the arena seating area. This could account for seepage of the signal outside of the building. As a result of this seepage, the FCC representatives offered a few technical suggestions and encouraged the use of a Field Intensity Meter to test the strength of the interference caused outside of the MCI Center.

Aside from relatively minor seepage, the first experiment proved that, with minor improvements, the three indoor arena event broadcast signals could be controlled easily by the NHL during a game in an arena.

Experiment 2:

Thursday, June 11, 1998, Game 2 Of The Stanley Cup Finals Between The Detroit Red Wings And The Washington Capitals At Joe Louis Arena In Detroit, Michigan

The NHL conducted its second event broadcast experiment during Game 2 of the Stanley Cup Finals between the Detroit Red Wings and the Washington Capitals at Joe Louis Arena in Detroit, Michigan, on June 11, 1998. The purpose of this experiment was to test, in a non-scientific manner, the delivery of an event broadcast at a different NHL arena. FCC representatives were not present during this experiment.

The FCC granted the NHL the authority to transmit its indoor arena event broadcasts on three different FM frequencies (94.1 MHz, 96.7 MHz and 107.9 MHz) in Detroit. Unlike in Washington, the NHL decided to use in Detroit only one of the three authorized frequencies to transmit the NHL Radio broadcast of the game during this experiment.

The NHL mounted one Scala FM50N wideband antenna in Joe Louis Arena. Given that Joe Louis Arena is approximately 20 years older than the MCI Center, Joe Louis Arena does not have an elaborate infrastructure above the ice surface and seating arena. In fact, the NHL Radio broadcast booth was located five feet from the ceiling of the arena. As a result, the NHL had to mount the antenna directly in front of the broadcast booth on a section of the ceiling overhang. While not ideal, the antenna and the transmitter were in very close proximity.

Unfortunately, while preparing for this experiment during the afternoon before the game, the transmitter malfunctioned so as to fix the power level at 1.5 Watts and to prevent any adjustments to that power level. Rather than forgoing the opportunity to conduct the

experiment, the NHL proceeded with the indoor arena event broadcast experiment knowing that the wattage could not be increased or decreased from 1.5 watts.

This proved to be a fortuitous accident. NHL representatives again listened to the game on portable FM radios which facilitated the ability to walk around different areas of the arena and outside of the arena. The indoor arena event broadcast signal was very clear in the press box area at 1.5 Watts. In the concourse of the suite level, the signal was clearly audible as one walked by an open suite entrance, but the signal faded noticeably as one walked in the concourse between suites. A reasonable explanation for this is that the suite's glass window appeared to allow the event broadcast signal to enter the suite from the arena's bowl and proceed through the suite entrance into the concourse area, but the cement wall of a suite prevented the same broadcast signal from penetrating the concourse as one walked between suites.

A similar experience occurred in the concourse of the arena's seating area (between the two seating tiers of the arena). As one walked past a seating section entrance (or walked through the entrance, or mini-tunnel, to the seating area), the signal was remarkably clear and powerful. However, as one walked between seating section entrances, the signal, while still clear, was not as strong as it was in the seating section entrance or in the seating area itself. As in Washington, the signal appeared to be more powerful on the side of the building where the antenna was located.

No signal was detected outside Joe Louis Arena, including in Canada.

Experiment 3:

Saturday, June 13, 1998, Game 3 Of The Stanley Cup Finals Between The Washington Capitals And The Detroit Red Wings At MCI Center In Washington, DC

Experiment 3 focused on conducting field test measurements outside the MCI Center of the signal strength of the indoor arena event broadcast system at two different power levels – five (5) Watts and two (2) Watts. The transmission equipment was installed in a manner identical to the installation used in Experiment 1, to be able to correlate measured data with experiential data and to avoid introducing new variables such as antenna placement or orientation.

Measurements were made at fifteen points located approximately one-fourth mile from the MCI Center of a signal on 99.9 MHz at 5 Watts. These were designated as the “outer measuring points.” Additional measurements were made at seven points located on the sidewalk directly outside the MCI Center of signals on 99.9 MHz and on 94.3 MHz, at both 5 Watts and 2 Watts of power.

The field measurements were taken by Doug Lane, a qualified and experienced broadcast engineer. The results of these measurements are found in Attachment 3 -- *NHL In-Arena Radio Field Study* prepared by Mr. Lane. These measurements reveal that at two (2) Watts, there were no measurable readings directly outside the MCI Center. These measurements support the observations made at the MCI Center in Experiment 1 and are consistent with the experience at Joe Louis Arena in Detroit where the power level was fixed at 1.5 Watts.

Experiment 4:

Tuesday, June 16, 1998, Game 4 Of The Stanley Cup Finals Between The Washington Capitals And The Detroit Red Wings At MCI Center In Washington, DC

Experiment 4 was a non-technical experiment and focused on the public response to indoor arena event broadcasting. The experiment took place at the exciting fourth, and what would prove to be the final, game of the Stanley Cup Finals.

The NHL set up a table in the MCI Center concourse near the main entrance. About one hour before game time, and on a first-come first-served basis, the NHL gave out 150 radios and survey forms, to anyone willing to fill out the form. The fans were asked to return the form before the beginning of the third period. Each survey form was numbered. As an incentive to complete and return the survey form, a contest drawing would be held using the survey numbers. Winners could claim prizes by returning the survey form. The NHL gave away various NHL and Washington Capitals' goods, with the grand prize being a Washington Capitals home jersey.

The fourth experiment transmission facilities were identical to those used during the first and third experiments conducted previously in the MCI Center. The NHL transmitted three separate channels of programming:

94.3 mHz	ESPN Audio
99.9 mHz	NHL Radio
104.7 mHz	Capitals Radio (WTEM).

In addition, before the start of the game, the NHL broadcast simultaneously over each of the three channels a continuous pre-recorded programming loop that told listeners that the NHL was conducting experimental indoor arena event broadcasts, describing what programming

could be heard on which frequency, encouraging the fans to tune to the different frequencies, and encouraging the fans to return the survey forms. Furthermore, during commercial breaks in the three broadcasts, the NHL originated and inserted its own live programming on the three frequencies, using an announcer in a production studio.

At the end of the fourth experiment fifty-four (54) surveys had been completed and returned. A representative sampling of the completed surveys are included in Attachment 4 to this Report.

In response to the question *Would you be interested in regularly listening to the games from your seat location? Why?* the completed surveys included the following comments:

- *Yes, play by play gives answers to injuries, updates, & current stats.*
- *To be able to get more in depth info, stats & reasons for penalties, etc.*
- *Yes, because the broadcasters help you with understanding what's happening in the game.*
- *Yes – I never could understand everything that goes on at the game – up-to-date on the game or anything I may miss.*

(This person also said in response to another question:
The amazing thing is I am hard-of-hearing & I could understand everything clearly – I could block out the surround sounds & hear the radio perfectly.)

- *Yes, adds extra facts and details to enjoyment of game.*
- *Yes, because if one of our guys got hurt I would know. Or if something happened and I couldn't see it the radio would tell me.*
- *Yes. Like the analysis & other information provided by commentators – I always carry radio headsets for NFL and Major League Baseball.*
- *Yes. It can help you know who has the puck if you can't see the number and/or don't really know the team.*

- *Yes. I like the play by play. As someone who doesn't know all the rules & can't follow the game without asking another person, it helps to listen & see what is going on at the same time.*

In response to the question *Do you think other fans would be interested in listening to in-arena radio broadcasts? Why?* the completed surveys included the following comments:

- *Yes, I am always hearing people around me ask who & why & what was the penalty call & how many points or PIM's does he have.*
- *We've been trying all season to listen & we just couldn't & it definitely enhances the overall game!*
- *Yes, because it assists the game.*
- *Yes, you become more involved in the game – you don't miss everything!*
- *Yes – they would enjoy the additional play by play.*
- *Yes, will help with players' names.*
- *I think if people knew it was available and not a hassle to remember to bring a radio & headphones to the game it may be of interest to some fans.*

In response to the question *If implemented, do you think in-arena radio broadcasting is an idea that the NHL should pursue to enhance the in-arena enjoyment of a game for the fans?*

Why? the completed surveys included the following comments:

- *Definitely, it can only work to better enhance the game.*
- *It's something we've all been waiting for – TV & radio have a good coverage to enhance the game – added benefit to be here & get all that's advantageous for us fans!*
- *Yes, because it helps the people who don't know a lot about hockey have a better understanding of what's going on.*
- *Yes – this information age encourages people to be hungry for info at all times – best thing in the arena – total involvement – broadcasters cheered me up – smiles.*

- *Yes, we listen when at baseball games, why not hockey?*
- *League should pursue vigorously – would increase hockey knowledge, enthusiasm and team/city loyalty.*
- *Yes. I think it is a good idea, especially for fans who only follow hockey casually, so they can learn the game more.*

II. CONCLUSIONS MADE REGARDING THE FEASIBILITY OF INDOOR BROADCASTS

The NHL has no doubts about the feasibility of indoor broadcasts. The four experiments conducted under the Commission's authorization established the feasibility of this type of service. The NHL demonstrated the ready availability of frequencies that will not cause or receive interference. Transmission facilities are easily constructed, operated and controlled. The fans overwhelmingly value and would use such a service.

While the NHL initially thought that the power level would be the most critical component, this did not prove to be true in either the MCI Center or Joe Louis Arena. The NHL quickly determined that five (5) Watts was more than was necessary and that approximately two (2) Watts was sufficient to generate a desirable signal inside the arenas without producing undesirable interference outside the arenas. The experiences might be different in other arenas, particularly in those parts of the arenas such as restrooms, concessions areas and suites, surrounded by greater amounts of steel and concrete. Nonetheless, based on these experiments, the NHL would not foresee the need for power levels in excess of five (5) Watts, and certainly not in excess of ten (10) Watts.

The NHL believes that antenna placement and antenna shielding are more important issues than power. In the Joe Louis Arena the antenna was "naturally" and significantly shielded, and the signal could not be detected outside. By contrast, in the MCI Center, the antennas were installed in an easily accessible and very open area in the catwalk of the arena. With greater attention given to antenna placement and design, the NHL believes that it could have achieved even greater control over signal propagation.

Because the NHL was using conventional FM broadcast equipment, including FM antennas intended for omni-directional and wide-area coverage, this suggests that equipment manufacturers might be able to design both antennas and transmitters more focused on containing and restricting coverage than on expanding coverage. Certainly a transmitter whose power could be more precisely set – perhaps to a tenth of a Watt -- would be very advantageous.

The NHL and its engineer have had substantive discussions with a major equipment manufacturer about specifying technical characteristics and constructing a special indoor arena event transmitter with limited power and more precise power level tuning. The manufacturer has preliminarily indicated that custom hardware can affordably be designed and built which could successfully contain and manage the indoor arena event signal.

III. OTHER INFORMATION

The NHL would like to continue experimenting with indoor arena event broadcasting during the upcoming hockey season at selected arenas in the United States. The NHL understands that any request for an extension of its authorization would be subject to the submission of specific frequencies and location coordinates for each arena. If such continued experimentation is successful, the NHL would then like the FCC to grant a permanent authorization to the NHL to conduct commercial indoor arena event broadcasting in the home arenas of each NHL member club located in the United States.

Respectfully Submitted,

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