

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

In re: The Matter of the Proposed Children's)
Memorial Hospital Rooftop Heliport to be)
located in Chicago, Illinois)
)

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**BRIEF TO DENY THE CHILDREN'S MEMORIAL HOSPITAL APPLICATION
FOR CERTIFICATE OF APPROVAL FOR HELIPORT**

NOW COMES the Streeterville Organization of Active Residents, hereinafter referred to as "SOAR", by and through its attorneys, HINSHAW & CULBERTSON, LLP, and for its Brief, states as follows:

I. INTRODUCTION

Children's Memorial Hospital ("CMH") is seeking a Certificate of Approval from the Illinois Department of Transportation ("IDOT") to construct and operate a rooftop heliport ("Proposed Heliport") at the new Ann & Robert H. Lurie Children's Hospital of Chicago in Streeterville.

CMH's application for this Certificate of Approval should be denied by IDOT. CMH's application establishes that the proposed rooftop heliport is on a high-rise surrounded by substantially taller buildings. The winds in the area are rife with turbulence, wind shear, wind vortices, airwake and wind gusts. Despite the application, all of the supplemental materials, and all of the testimony and exhibits from the July 2009 and June 2011 public hearings, there has never been a safety study or risk analysis of CMH's proposal. This is astounding and unacceptable given the densely populated environment in which CMH proposes to locate the heliport.

CMH has not identified emergency landing areas for takeoff or landing, or along the ingress and egress routes through Streeterville to the proposed heliport. Incredibly, the hospital's documented "escape route" for a rejected landing along the predominant approach path is directly into a substantially taller high-rise structure. These serious safety issues cannot be mitigated and on this basis alone, CMH's application should be denied.

Experts agree that a pilot flying to the proposed facility cannot rely on data from O'Hare or Midway airports to make decisions as to whether conditions support safe flight. There is also agreement that real time weather information along the Streeterville flight paths and at the heliport is crucial for pilots to make accurate go/no-go flight decisions. CMH has proposed the use of an automated weather system (AWOS) to meet this requirement.

IDOT's consultants testified that the AWOS will substantially under-predict wind speeds, a key safe flight criterion, particularly when the wind is coming from the predominant westerly wind direction. They do not dispute that the AWOS is likely to provide pilots with inaccurate and misleading wind information. The AWOS' ability to accurately predict other conditions used to determine flight safety (e.g., whether a flight would fall under VFR rules) is unknown.

There are many other unresolved serious and significant safety issues. A safe alternative heliport is located on the waterfront just 8 tenths of a mile away from the hospital. Needless, to say SOAR implores IDOT to use reasonable judgment and deny the application.

II. FACTS

SOAR is a 36-year-old non-profit organization that works on behalf of Streeterville residents by preserving, promoting and enhancing the quality of life and community. (Tr. 6/23/11, pg. 15). SOAR's standard development review process is well respected by City of Chicago officials, real estate developers and residents. SOAR and the residential community it represents (i.e., 19,437 residential units in an area 3/4 mile square) have an active interest in the Streeterville neighborhood, including issues which affect the safety of the residents as well as all those who work in Streeterville and the thousands of national and international visitors to the area. (SOAR Ex. 14, pg. 2). In the interest of public safety, SOAR has retained some of the most well respected experts in the aerospace engineering, aviation safety and emergency medicine industries to review and comment upon the proposal, including Dr. Thomas Corke, Ph.D., Dr. Patrick Veillette, Ph.D., Mr. Mark Eugene Doub, and Dr. Bryan Bledsoe, M.D. Independently, each has concluded that IDOT should deny CMH's heliport application.

A. Before July 2009 Hearing

In 2007, SOAR asked Dr. Corke and Mr. Doub to review the proposed heliport materials and provide their professional assessment. Both documented substantive safety issues, which SOAR provided to CMH and IDOT in advance of the December 2007 Plan Commission hearing on CMH's proposal. Mr. Gary Stevens testified on behalf of CMH at that hearing, and acknowledged IDOT's receipt and review of these materials. (SOAR Ex. 33, pg. 93). At this same hearing CMH counsel Mr. Jack George stated, "We're asking that the use of a heliport, helipad, be permitted in sub area C on this planned development... as Mr. Stevens just indicated, the actual licensing takes place by the State of Illinois." (SOAR Ex. 33, pg. 128)

In September 2008 IDOT notified SOAR of its intent to enter an order on or after October 6, 2008 to approve CMH's application for the proposed heliport. SOAR responded within the period specified, and informed IDOT that it should not issue the order to approve the proposed heliport. (SOAR Ex. 30). In December 2008 Dr. Corke, Mr. Doub and SOAR met with IDOT to detail the serious and significant safety issues and concerns with CMH's proposal. (SOAR-IDOT Meeting 12/17/08 Power Point Presentation.)

Despite the many valid safety concerns, IDOT issued an order on April 23, 2009 for Docket #08-08 for the Proposed Heliport, providing notice of its intent to grant a Certificate of Approval if no objection or request for hearing was filed. SOAR followed the proper procedure under Section 60 of the Illinois Aeronautics Act objecting to the issuance of a Certificate of Approval and requested a hearing. (Written Request for Hearing as to the Validity or Reasonableness of IDOT's Order Regarding the Proposed Children's Memorial Hospital Heliport and Motion for an Evidentiary Hearing in Which the Safety of the Proposed Heliport Can be Fully Explored, 4/29/09). On July 22, 2009 the IDOT hearing commenced and concluded on July 25, 2009 at which time Judge Neville closed the record. (Tr. 7/25/09, pg. 106).

Prior to that July 2009 hearing, SOAR was allowed to depose two CMH consultants. First, Mr. Jeffrey Jackson, the project manager from the heliport design company Landrum and Brown retained by CMH, and second Dr. Meiring Beyers, from RWDI, a wind engineering firm also retained by CMH. SOAR's concerns were elevated to even greater heights when these two consultants testified that their companies had not been asked to conduct a safety study, nor did they conduct a safety study. Neither could

define what a safety study would entail. (SOAR Exhibit 34, pgs. 49-50, 54-55, 57, 85, 102, 117-120, 151-153; SOAR Ex. 35, pgs. 30-34, 39-42, 50, 79, 127-128).

B. July 22 - 25, 2009 IDOT Hearing

At the July 2009 hearing SOAR presented several witnesses: Dr. Patrick Veillette, Ph.D., Dr. Thomas Corke, Ph.D., Dr. Bryan Bledsoe, M.D., Mr. Mark Eugene Doub, Ms. Patty Frost and Ms. Madlyn Daniel. Dr. Veillette testified on the failure to conduct a safety study or risk analysis including assessment of emergency landing locations, escape routes for pilots needing to abort a landing, wind conditions prime for Loss of Control (LOC) states, and the lack of evidence as to the efficacy of the proposed AWOS. Dr. Corke testified on the inadequacies of the wind studies that had been conducted. Mr. Doub testified that CMH's high-risk proposal conflicts with the City of Chicago Municipal Code and the FAA's Advisory Circular for hospital heliports, that the proposed AWOS will be inadequate, and that the alternative ground-level heliport is a far safer alternative. Dr. Bledsoe testified that the alternative ground-level heliport was far superior to the rooftop heliport for everyone onboard the helicopter and on the ground, and that this alternative site would pose no significant risk to patients to travel the less than one mile to the hospital facility. Ms. Patty Frost testified regarding CMH's use of federal funds in the construction of its new hospital. Ms. Madlyn Daniel testified as to the Pan Am helicopter accident that resulted in New York City's ban on rooftop heliports.

1. Dr. Patrick Veillette, Ph. D.

a. Background

Dr. Patrick Veillette is a recognized rotorcraft safety expert, with a doctorate in aerospace civil engineering. (SOAR Exs. 4 and 50). He is an aeronautical researcher, author, and past adjunct professor, as well as an Aviation Accident investigator. *Id.* He has been a major contributor to special studies of helicopter operations (including EMS) to the US General Accountability Office and the Department of Homeland Security. *Id.* He is also internationally acclaimed for his aeronautical safety publications and a recipient of the Royal Aeronautic Society's Journalist of the Year Award for the best safety submission. *Id.*

He began his analysis of CMH's heliport proposal in 2009. He conducted an extensive review of the materials submitted to IDOT in conjunction with CMH's application and attended the deposition of Landrum & Brown's Jeffrey Jackson. (SOAR Ex. 2, pg. 3-4).

b. The Lack of Any Safety Analysis is Fatal to the Application

At the July 2009 hearing Dr. Veillette testified that "The first thing that hit me when I went through this extensive amount of material is that there was no safety analysis done at all." (Tr. 7/23/09, pg. 57). He stated that the references in CMH's application to the lack of accidents at certain other heliports is not considered by the aviation industry as an indicator of safety of a proposed project. *Id.* at 58.

Dr. Veillette referenced the deposition of CMH consultant Mr. Jeffrey Jackson from Landrum and Brown, the firm hired by CMH as a general contractor to draft a planning report (and ultimately the application for the proposed heliport). (SOAR Ex. 34, pg. 31). Mr. Jackson was asked, "Does anyone at Landrum and Brown have expertise in

helicopter safety planning?” and his answer was “No, that was not in our scope.” Furthermore, Mr. Jackson admitted that Landrum and Brown never made a recommendation as to whether it was safe or unsafe to operate the heliport. (Tr. 7/23/09, pg. 60; SOAR Ex. 2, pg. 6; SOAR Ex. 34, pg. 57). Mr. Jackson further admitted, “We didn’t do a safety analysis, and to do a safety analysis, I think it would require a lot of things. I would, again, have to sit down and try to determine what would be required to do an appropriate safety analysis.” (SOAR Ex. 34, pg. 152).

A safety analysis, per Dr. Veillette, would require a team of multi-disciplinary experts in work safety, helicopter operations, accident investigations, etc. to establish a comprehensive list of hazards. (Tr. 7/23/09, pg. 60). He explained that it is standard engineering and aviation safety practice to do an extensive preliminary hazard/risk assessment on any project, after which an analysis must be done concerning the frequency and predictability of the hazard/risks and a determination of methods to mitigate the risks. *Id.* at 60-61. If the risks can be controlled to a satisfactory level the proposal goes forward. If the risk cannot be controlled to an acceptable level, the proposal should not move forward. (SOAR Ex. 34, pgs. 57-58, 60-61). This analysis has never been done for CMH’s heliport proposal. (Tr. 7/23/09, pg. 57).

Dr. Veillette testified that there were several basic hazards that were never even identified or addressed including the: a) lack of suitable emergency landing areas; b) lack of available escape routes; c) potential for near mid-air collisions; d) urban night time conditions; e) wind conditions which are prime for Loss of Control (LOC) states; f) lack of evidence that the AWOS would adequately predict winds; g) challenges of the

Chicago weather conditions; and, h) “hero mentality” of pilots affecting flight decisions. (SOAR Ex. 2, pg. 10).

According to Dr. Veillette, several of these basic hazards, if left unmitigated, would, in and of themselves, render the proposed location unsafe for a heliport including the lack of suitable emergency landing areas and escape routes, wind conditions prime for loss of control states, and the lack of any evidence that the AWOS could accurately predict winds. (Tr. 7/23/09, pg. 65; SOAR Ex. 2, pg. 10).

c. No Emergency Landing Areas Identified by CMH

Dr. Veillette highlighted Mr. Jackson’s admission that Landrum and Brown was not tasked with identifying emergency landing locations, and had not identified any emergency landing locations. (SOAR Ex. 35, pg. 61). This was inconsistent with Mr. Jackson’s following statement at the July 2009 hearing, “We followed the City of Chicago Municipal Code”. (Tr. 7/22/09, pg. 75). Per Dr. Veillette, the City of Chicago Municipal Code Title 10, Article III Heliports, Sections 10-36-380 and 10-36-420, require that emergency landing areas be identified and limits those areas which can be considered. (SOAR Ex. 17d; IDOT Application for Heliport/CMH August 6, 2008 Appendix G).

An aerial photograph of the proposed location, clearly showed that there are no adequate emergency landing areas at the proposed heliport, for the proposed flight paths, or any other flight path. (Tr. 7/23/09, pg. 71, SOAR Ex. 2, pg. 17). Dr. Veillette confirmed by physical inspection that no emergency landing areas are available which meet the criteria. (Tr. 7/23/09, pgs. 70-71).

d. No Escape Routes Identified by CMH

Dr. Veillette explained that there must be an escape route available for every potential flight path and in this case no escape routes had been identified for any of the flight paths. He further stated that the use of dual engine helicopters does not preclude the need for escape routes. (Tr. 7/23/09, pg. 69-70).

e. CMH Failed to Consider Loss of Control States

The wind velocities in this particular environment make maneuvering the helicopter very difficult. *Id.* at 73. Dr. Veillette was particularly concerned with two types of Loss of Control (LOC), the Loss of Tail Rotor Effectiveness (LTE) and Settling with Power (SWP). (7/23/09 pg. 73; SOAR Ex. 2, pg. 19).

Strong flow recirculation patterns are known to cause LTE. These phenomena actually occur at lower wind speeds below CMH's proposed wind operating limits. (Tr. 7/23/09, pg. 74). Dr. Veillette outlined various LTE conditions for a variety of wind directions for the two flight paths referenced in CMH's application. For the southeast flight path winds are conducive to: main rotor disk vortex 28% of the time, weathercock stability 40% of the time, tail rotor vortex ring 62% of the time. All of these conditions cause LTE and the possibility of a crash. These numbers for the northeast flight path were 34%, 34% and 49% respectively. (Tr. 7/23/09, pg. 75; SOAR Ex. 2, pg. 20). LTE occurs abruptly and requires a pilot to instantly recognize the problem and take corrective action. Corrective action requires adequate physical space for the pilot to maneuver the helicopter. Obstructions along the proposed flight paths and at the proposed heliport, however, will severely limit a pilot's ability to safely maneuver out of LTE. (SOAR Ex. 3, pg. 7). Dr. Veillette expressed concern that these conditions had not been studied by Landrum and Brown or RWDI. (Tr. 7/23/09, pg. 73).

As for SWP he found that wind conditions are such that over 40% of the time the winds will be conducive to SWP for both the northeast and southeast approach paths due to a tailwind conflict. (Tr. 7/23/09, pg. 76; SOAR Ex. 2, pg. 21).

Dr. Veillette indicated that LOC problems happen very rapidly and require instant pilot maneuvering and that these problems are particularly prevalent at this location because the buildings prohibit aligning the flight paths against the prevailing winds. (Tr. 7/23/09, pg. 77).

f. AWOS was Not Proven Effective for this Urban Environment

As to the proposed AWOS, Dr. Veillette testified that there was no evidence that any testing was done to validate that the AWOS will provide pilots with valid, accurate data along the flight paths or at the heliport, and that there may be no accurate location for an AWOS. He explained that the two anemometers placed on Prentice Women's Hospital had two vastly different readings on the roof of the same structure. *Id.* at 80. Therefore, it was very likely that there would be misleading information received and disseminated by the AWOS. *Id.* He also noted that the FAA Advisory Circular requires an AWOS to be located in free open air space in order to avoid misleading information that might be disseminated due to, free stream air blockage, turbulence, or vortices. *Id.*

g. Conclusion

Dr. Veillette found that a safety plan must be developed listing all of the anticipated hazards along with a strategy analysis for risk abatement. (Tr. 7/23/09, pg. 85). Furthermore, alternative sites must be considered which was never done by CMH. *Id.* Ultimately Dr. Veillette concluded, "Given the unique operating environment here, the terrain, the distractions, the lack of escape routes, the lack of emergency routes, as a professional aviator, I have serious doubts whether this site could ever be safe." *Id.*

2. Dr. Thomas Corke, Ph.D.

a. Background

Dr. Corke is a renowned aeronautical and aerospace engineer and professor from the University of Notre Dame. (SOAR Ex. 46). He is particularly experienced in the study of wind flow, fluid dynamics and wind tunnel testing and is the Founding Director of the Notre Dame Institute for Flow Physics and Control and the Director of the Hessert Laboratory for Aerospace Research. (Tr. 6/24/11, pgs. 16-18). The institute is designated as a University Research Partner for a number of companies including General Electric, Boeing, Bell Helicopter, Honeywell and Pratt & Whitney. *Id.* at pg. 17. He is a co-inventor with Bell Helicopter on two patents. *Id.* Dr. Corke has been involved in the research and study of helicopter airflow for over twenty years. (SOAR Ex. 46).

He began his analysis of CMH's heliport proposal in 2007. He conducted an extensive review of the materials submitted to IDOT in conjunction with CMH's application and has participated in several key meetings, including the deposition of RWDI's Dr. Beyers, the 2008 SOAR meeting with IDOT, and the 2007 City of Chicago Plan Commission hearing. (SOAR Ex. 5, pgs. 3-4; SOAR Ex. 48, pgs. 3-4).

b. RWDI Study Was Not a Safety Analysis Rate

At the July 2009 hearing Dr. Corke testified that, "the RWDI utilization study does not address safety or guarantee safe operations" (Tr. 7/23/09, pg. 116) and that RWDI "avoided the word 'safety', and ... in deposition with Dr. Beyers, they make that direct assessment that it wasn't a safety study." *Id.* Dr. Corke reiterated Dr. Beyers' testimony that two of the three studies done by RWDI were merely for qualitative purposes and were not to be used for any quantitative determination, which could be used to conclude safety. *Id.* Dr. Corke also informed IDOT that RWDI had, in a letter,

admitted that though it had performed a computational fluid dynamics (CFD) simulation that it was not to be used for any quantitative purposes on which any safety conclusion could be drawn and rather wind tunnel experimentation was necessary. (Tr. 7/23/09, pg. 117; SOAR Ex. 57, pg. 3).

c. RWDI Study Over-Estimated Utilization Rate

Dr. Corke argued that the RWDI wind tunnel study was not adequately performed and significantly over estimated the heliport utilization rate. (Tr. 7/23/09; pg. 117). It also focused strictly on the heliport itself, not the flight paths to or from the heliport. (SOAR Ex. 35, p. 50) Dr. Corke reiterated Dr. Beyers' admission that, "we did not attempt to do anything related to safety, [rather we] merely [performed] a calculation of utilization based on published criteria.". (Tr. 7/23/09, pg. 118; SOAR Ex. 35, pgs. 39-40). Dr. Corke explained that RWDI used the Department of Interior recommendation that helicopter operations be terminated if the mean wind speed exceeded 30 knots or a maximum gust spread exceeded 15 knots. (SOAR Ex. 5, pg. 7). It was explained that the wind flow around buildings produces a unique microclimate of complex three-dimensional airwakes, wind shear flows, and vortical flows, which can produce wind speeds three times higher and wind gusts two times higher, than occur in open areas and large wind shear changes. (SOAR Ex. 5, pg. 8).

The metrics of merit chosen by RWDI and put forth by the hospital for its heliport operations require knowledge of the maximum mean wind speed and maximum gust level. (Tr. 7/23/09, pg. 128). Dr. Corke explained that the only way to determine these variables is to accurately predict wind speeds in the Streeterville environment using wind tunnel experiments, and that there is no adequate computer flow simulation, which can measure velocities. *Id.* at 120. Furthermore, when performing this wind tunnel testing

one must determine the maximum mean wind speeds and maximum gust levels at multiple points along the flight paths and at the heliport. Dr. Corke indicated that this could not be done by simply taking a set of vertical measurements at the centerline of the heliport. *Id.* at 124-125. As RWDI only performed measurements at a single vertical line above the heliport, RWDI could not guarantee that the maximum mean wind speed and maximum gust levels were identified. (SOAR Ex. 5, pg. 18).

The RWDI flight path measurements were insufficient as they only considered two flight paths at one approach angle with two wind directions that were not the predominant wind direction. (SOAR Ex. 5, pg. 20). Dr. Corke pointed out that the RWDI study was insufficient in scope and that he had recommended RWDI validate the wind tunnel study by comparing it to the full-scale data available from the anemometers on top of the Prentice Women's Hospital. Dr. Corke compared the wind tunnel experiment to the full-scale Prentice data and determined that the RWDI wind tunnel experiments were, **at a minimum, under-predicting wind speeds by 44% for the predominant wind directions** (southwest to northwest). (Tr. 7/23/09, pg. 141; SOAR Ex. 5, pg. 17).

d. AWOS Likely to Provide Misleading Information

Dr. Corke testified that the three-dimensional flow on a building rooftop made it highly unlikely that one or even a few rooftop measurements would be sufficient to categorize the wind conditions. He stated that the "AWOS is technology that was developed for and used in open terrain" and that while "it has the capability of determining wind shear... The problem with that is it uses an algorithm which is [calibrated] for its location, which is open conditions." (Tr. 7/23/09, pg. 148). He further

explained that it was highly suspect that the AWOS could be used, and that it would likely provide misleading information. (Tr. 7/23/09, pg. 148; SOAR Ex. 5, pg. 22).

e. Conclusion

Ultimately Dr. Corke testified that the wind tunnel study was not adequately performed and not adequately analyzed. As a result there were significant over estimates of the heliport utilization. (Tr. 7/23/09, pg. 148). Further, the wind tunnel flight path studies were not adequate, not performed on a final building configuration and overlooked the conditions close to the hospital building. *Id.* at 149. It was also highly unlikely that one or even a few rooftop measurements by AWOS would be sufficient to categorize the wind conditions. *Id.* Finally, if the utilization opinion of RWDI was being used as a criterion for safe flight then the study significantly overstated and over-predicted safe flight conditions. *Id.* Accordingly it was Dr. Corke's recommendation that IDOT "not certify this heliport." *Id.*

3. Mr. Mark Eugene Doub

Aviation safety expert, Mark Eugene Doub, testified by affidavit that he is a rotary and fixed wing aircraft pilot. He was with the navy for 20 years during which he was a rotary and fixed wing instructor and a naval accident investigator. He was also a local investigator for National Transportation Safety Board (NTSB) and the US accredited representative for multiple foreign accident investigations. He was also the principal designer of the NTSB Aircraft accident investigation course and was instructor of that course. Subsequent to working at the NTSB, Mr. Doub was employed by the US Department of Transportation Safety Institute where he trained over 1,500 students each year on accident investigations and aircraft safety. (SOAR Ex. 17, paras 1-3).

a. CMH Proposal is High Risk

Mr. Doub testified that the CMH heliport proposal is high-risk from a public safety standpoint. He outlined specific recommendations made in Section 400b of the FAA's Advisory Circular 150/5390-2B (SOAR Ex. 17b) including the need for hospital heliports to support instrument operations, and future expansion. (SOAR Ex. 17, para. 7). He explained that due to the lack of escape routes for missed approaches, the CMH's heliport could not support instrument operations. (SOAR Ex. 17, paras. 7, 15). He also explained that based on the hospital's heliport layout map, that the heliport could not support future expansion. (SOAR Ex. 17, para. 17)

b. Chicago Municipal Code Requires Identification of Emergency Landing Areas

He referenced the City of Chicago Municipal Code Title 10, Article III Heliports, Section 10-36-420 which requires that a map of intended emergency landing areas be included in a heliport license application, and Section 10-36-380 which indicates criteria for valid emergency landing areas. (SOAR Exs. 17, para. 8, 17d and 17e). He pointed out that earlier in the year, two flight providers to CMH needed to emergency land a helicopter. One emergency landing was due to the loss of hydraulic pressure, the second due to loss of an engine on a dual-engine aircraft. (Tr. 7/23/09, pgs. 154-155; SOAR Ex. 17g and 17h)

Mr. Doub testified, "The vertical structures along the ingress and egress routes to the proposed heliport create obstacles around which pilots must navigate. These structures, with varying absolute and relative heights decrease a pilot's ability to maneuver, handle missed approaches, or handle emergency departures. These structures

also inhibit visual cues for pilots, and contribute to wind shear and wind turbulence.” (SOAR Ex. 7, para. 15; Tr. 7/23/09, pg. 156).

c. AWOS is a Talking Windsock

Mr. Doub referred to the AWOS as a talking windsock, which “will not provide pilots sufficient information to assess whether or not it is safe to fly. This device gathers data at a single point at the height at which the device is installed. This data may not be representative of the conditions at heights above or below the device or along the flight paths to and from the heliport.” (SOAR Ex. 7, para. 17; Tr. 7/23/09 pg. 157). He explained that, “this phenomenon was experienced on January 18, 2002 at the University Hospital of Cleveland where two windsocks installed on adjacent buildings at different heights indicated different wind speeds and directions. A HEMS flight crashed into a building, fatally injuring two and seriously injuring a third. Tail wind and wind gusts were documented as factors in this accident.” *Id.* “The data from the Super AWOS is not correlated to surrounding observations (e.g., Midway Airport or O’Hare Airport). Additionally, the device does not provide ceiling or visibility data – critical information for HEMS pilots.” *Id.*

d. Safety Plan Required

He stated that a safety plan was required to evaluate CMH’s proposal and itemized what a safety plan must include. (SOAR Ex. 7, para. 20. *Id.*, pg. 158).

e. Alternative Ground-Level Heliport is Safer

He testified that the Dime Pier heliport (which he referred to as the police department helipad) mitigates many of the safety hazards identified with CMH’s heliport proposal, and that this alternative heliport is located adjacent to, not in the middle of, a densely populated environment. (SOAR Ex. 7, para. 25; Tr. 7/23/09 pgs. 160-61). The

closest vertical obstructions are at some distance from this helipad which: removes potential obstacles along the flight path and at the heliport, improves the ability to maneuver/handle missed approaches or emergency departures, improves visual cues for pilots, and lessens the immediate impact of vertical structures on wind conditions. He further commented that this alternative, “is at ground level and would not require pilots to make a pinnacle landing. *Id.* Emergency landings at this facility would pose less risk for collateral damage to people and property.”

He concluded by reiterating that CMH’s heliport application was high-risk from a public safety standpoint, and urged IDOT to deny the application. *Id.* at 161.

4. Dr. Bryan Bledsoe M.D.

Dr. Bledsoe is a board certified physician, a fellow of the college of emergency Physicians, and a renowned expert on emergency medicine. (SOAR Ex. 12). He is an expert in HEMS safety and testified at the 2009 NTSB hearings on this issue. (SOAR Ex. 11, pgs. 4-7). He reviewed a substantial amount of material related to the application and its contents *Id.* at 8-9, and testified that recent studies have begun to demonstrate that few patients actually benefit from medical helicopter transport, even during most emergencies. *Id.* at 7.

Dr. Bledsoe stated that the conclusions reached by the CMH regarding its use of an off-site heliport were unsupported by the authoritative medical studies on the topic and that there is no evidence that any of patients referenced in CMH’s Off-Site Helipad report would have had any different outcome if the alternative heliport site (i.e., the Dime Pier heliport) was used. *Id.* at 10-12. He explained that the Emergency Medical Treatment and Active Labor Act requires patients to be stabilized prior to transfer between hospitals, adding negligible risk from the additional time, if any, associated with landing at the

alternate site. *Id.* at 10. “Like we see in the situation of these inter-facility transports, there’s absolutely really no harm or risk in stopping and transporting to a ground ambulance and making a subsequent transport to the hospital.” (Tr. 7/23/09, pg. 99).

Furthermore, Dr. Bledsoe noted that the CMH Off-Site Helipad report should have considered the safety of the ground-level alternative site versus the safety of the proposed rooftop heliport. “As we look back at the peaks and valleys of the air medical crashes that we’ve had in the last couple of years, the factors that really came into play were bad weather and a lot of it was bad weather decision making by the pilots, some of which was due to inadequate information like we saw in south Texas.” *Id.* at 100. It was ultimately Dr. Bledsoe’s conclusion that the Dime Pier site was a safer location and “...the alternate site over on the lake is not going to impact the morbidity or mortality of the patients I’ve been able to look at.” *Id.* at 106. “I don’t see any medical reason to choose to not use the alternate site over on the lake”. *Id.* at 109.

5. Ms. Patty Frost

Ms. Patty Frost, a long-time Streeterville resident and SOAR board member, testified that SOAR asked CMH as to whether or not it was using federal funds to construct the new hospital. CMH acknowledged it was “seeking federal funding for... [bridges to connect the parking deck] and that there were certain other areas in the construction where they had federal funding.” *Id.* at 174. She noted that CMH’s use of federal funding can result in compliance with the FAA Advisory Circulars becoming mandatory.

6. Ms. Madlyn Daniel

Madlyn Daniel, a long-time Streeterville resident, was in New York City on May 16, 1977 working in Manhattan on the 8th floor of an office building located directly

across the street from the Pan Am building. (SOAR Ex. 20; Tr. 7/24/09, pgs. 10-11). That day she heard a thunderous noise, which turned out to be a helicopter's rotor digging into the rooftop of the Pan Am building. This accident sent pieces of the rotor ricocheting and flying throughout the neighborhood. *Id.* The debris from the accident was "caught by swirling winds in canyon-like streets [which] was swept over the top of the Biltmore Hotel before plummeting into Madison Avenue, where three persons were hit. *Id.* at. 11. "Not only did people on top of the heliport die that day, but a pedestrian two blocks away was struck with a piece of the rotor and killed." *Id.* In all there were four fatalities, one serious injury, and an additional twenty that suffered minor injuries as a result of this occurrence. *Id.* at 11-12.

7. Alderman Brendan Reilly

Alderman Brendan Reilly testified that the Dime Pier heliport "absolutely could be used given the permissive language in the ordinance governing that helipad." (Tr. 7/23/2009, pg. 37). That ordinance explicitly provides "The heliport would be used by persons and organizations providing services in emergency situations, including but not limited to police, military, fire, medical, Department of Homeland Security, law enforcement, and other governmental and private emergency transportation agencies. *Id.* (Emphasis added.) He stated that the Dime Pier heliport was intended for CMH's use in the event CMH's rooftop heliport was not approved. *Id.*

8. CMH

CMH counsel Mr. George stated at the beginning of the July 2009 hearing, "[i]t was pointed out at the Plan Commission that the opportunity to obtain a license for this location would be the subject of further hearings by the Illinois Department of

Transportation”. (Tr. 7/22/09, pgs. 18-19). He promised that the helipad would be built and that it would exceed state, federal and city guidelines. *Id.* at 22.

CMH’s Mr. Robert McKenna testified that CMH referred to City Ordinances when designing the proposed heliport. *Id.* at 57, 59-62. According to him, CMH had taken “a lot of care and done a lot of due diligence in looking at all the codes and ordinances”. *Id.* at 64. It was the compliance with the codes and regulations that in his opinion rendered this facility as safe as possible for the intended use. *Id.* at 64-65.

Likewise, Landrum and Brown’s Mr. Jackson testified that they followed the City of Chicago Municipal Code as well as the regulations of the Illinois Department of Transportation Division of Aeronautics. *Id.* at 75. When it came to designated flight paths Mr. Jackson admitted that considerations included potential obstacles, available emergency landing areas, congestion on the ground, in the air and prevailing winds. *Id.* at 77.

CMH counsel Mr. Alan Farkas noted that IDOT has the responsibility for determining the safety of proposed heliport and that the other governmental bodies including the Chicago City Council, the Chicago Zoning Committee, and the Chicago Plan Commission deferred the issue of safety and compliance with regulatory standards to IDOT. (Tr. 7/25/09, pg. 17). He further argued that the information will demonstrate that the helipad would be operating “in full compliance with the applicable regulations and the safest manner possible”. *Id.* at 53. No one testified for CMH that a safety study had been done and to the contrary, CMH’s attorney admitted that no safety study was performed because it was “beyond the scope of [the] concentration” of the experts and consultants hired by CMH. *Id.* at 21.

RWDI's Dr. Beyers testified that Section 14.810(a) of the Aviation Safety Rules requires the hospital to consider the nature of the terrain, including the study of the affect of winds at and near the heliport. (Tr. 7/22/09, pg. 86). He explained, "[w]e want to understand not what the conditions are at Midway Airport, but how those conditions translate into the conditions at the heliport, because they are different. And we understand that there are influences at the heliport created by ... buildings surrounding it and its elevated structure, and there will be differences to that wind." *Id.* at 91. Dr. Beyers explained that the surrounding buildings and the CMH building itself will create wake-zones and swirling winds and understanding of those conditions is "very important" which is why wind tunnel experimentation must be performed to "put more quantification into how those winds are accelerating across the building" which cannot be determined by mere computational fluid dynamics (computer modeling). *Id.* Dr. Beyers testified that wind tunnel experimentation is done "to identify safe and favorable areas for which to approach the site." *Id.* at 96-97. He explained that wind tunnel testing is "one of the only trusted sources to predict wind flows" (*Id.* at 98) and that wind tunnel predictions needed to be compared to the real time data collected at the Prentice Women's Hospital to determine whether the wind tunnel tests were representative of full-scale conditions at the site. *Id.* at 103.

CMH CEO Mr. Patrick Magoon, testified that, "helicopter pilots will fly to our hospital heliport only when the wind and weather conditions are safe. A state-of-the art weather station will be constructed on the heliport to share realtime wind and weather conditions with pilots before their flights begin as well as in flight. Helicopter flights will be prohibited if winds exceed 25 knots and wind gust speeds exceed 15 knots." *Id.* at 27-

28. Mr. Farkas argued that when a helicopter slows and descends into the “unique character of this [Streeterville] environment” the pilot will be provided with “every tool that we can” and “at that point [the pilot] has access to the information from the AWOS” (Tr. 7/25/09, pg. 45) He asserted, “The unique issue here is the pilots will have ... the wind velocity from the AWOS mounted where the air is free.” *Id.* at 46. He addressed the failure to list escape routes for aborted landings and emergency landing areas for malfunctioning helicopters by arguing that “pilots are trained to recognize the open skyline as their escape route and to be able to identify landings should the need arise” (ignoring that the helicopter may not be able to ascend and that no emergency landing areas are available around this densely populated urban area). He also acknowledged that Mr. Doub was correct that the heliport does not comply with the FAA advisory circular because it is not set up for instrument flight. *Id.* at 55. His only explanation was that CMH did not want to encourage “anybody flying when they need to rely on eye or instrumentation”. *Id.*

CMH called upon Mr. Rex Alexander to address “the extent any regulations are applicable to the heliport” (Tr. 7/22/09, pg. 105). Mr. Alexander explained that any pilot flying to CMH must use FAA-certified weather reporting systems. *Id.* at 113. “We are very, very strict on the weather reporting systems we can utilize. We can’t just look at the Weather Channel. Out of that, the AWOS systems are a crucial piece of that.” *Id.* “Checking weather, we evaluate the weather criteria from both destination, en route, and return trip, and ensure that we have a window of opportunity that will maintain safety margins throughout the entire procedure.” *Id.* He further testified that pilots “need a

weather window of approximately two hours for a standard transport” and due to expected delays, pilots “look for three and four-hour windows.” *Id.*

Mr. Alexander testified that a pilot to CMH will analyze, “the landing site at altitude... looking at wind conditions, approach paths, and emergency egress” and “[a]t any point before or during the transport the pilot [may] cancel or abort the flight.” (Tr. 7/22/09, pgs. 115, 117). He assured that CMH “will have a strict adherence to published HEMS weather minimums”. *Id.* at 118. He testified that CMH will not fly if the winds exceed 25 knots or a 15-knot gust spread. *Id.* at 120. “[I]n conjunction with that, Children’s has committed to putting an AWOS [weather reporting station] on-site” *Id.* He admitted that “currently, utilizing weather that’s available, be it O’Hare or Midway, the pilot would have to guess as to what he was going to run into at the site. Children’s is going to put an AWOS station at the site and take the guesswork out of it, making it much safer.” *Id.* He also explained that CMH wants to use the AWOS to assist a pilot in selecting an approach path to use. *Id.* at 144.

Mr. Alexander was asked at the July 2009 hearing whether there were any emergency landing areas in Streeterville. *Id.* at 146-47. He avoided the question indicating, “I don’t think the people of Chicago would like it if we took a bulldozer and made an open area every ten feet” (*Id.*) and vaguely said “there are several areas... within three to four miles, easily, that a pilot could get to and safely land....”. *Id.* at 148. However, he gave no specific examples of such an area. *Id.*

C. July 26, 2009 to June 23, 2011

After the July 2009 hearing, IDOT did not grant the Certificate of Approval. Instead, despite the closure of the record by Judge Neville on July 25, 2009 (Tr. 7/25/09, pg. 106), IDOT’s Chief Counsel, Ms. Ellen Schanzle-Haskins, sent correspondence to

CMH dated August 5, 2009 in which she conveyed the request of IDOT consultant Mr. Ray Syms for substantial additional material including: (i) plans which comported with the current design of the heliport as it had changed since the application had been filed; (ii) request to study the way in which the heliport could be designed to best reduce turbulence; (iii) an accurate depiction of obstructions penetrating the 8:1 slope; (iv) a layout of available approach/departure arcs specified for wind conditions; (v) a layout of the available approach departure paths and options in the event of a rejected landing or missed approach; (vi) emergency procedures both in landing and take off. (SOAR Ex. 60).

In August 20, 2009 and January 19, 2010 correspondence to IDOT, SOAR objected to the request for additional materials, stating that under the applicable statute and rules, the initial application of CMH simply should have been denied for the lack of accurate and thorough study and no new materials and information should have been considered after Judge Neville closed the record at the conclusion of the July 2009 hearing. (SOAR Exs. 61 and 69).

Despite SOAR's objections, CMH submitted supplemental information, which did not respond to all of the well-founded concerns raised by Ms. Schanzle-Haskins and Mr. Syms in their August 5, 2009 correspondence. Notwithstanding SOAR's objection, SOAR submitted Dr. Corke and Dr. Veillette's review of CMH's supplemental response. (SOAR Exs. 67 and 68)

Subsequent to that, IDOT contracted with Joseph Horn and Continuum Dynamics to perform a Computational Fluid Dynamics (CFD) simulation. Dr. Corke and Dr. Veillette warned IDOT that Computational Fluid Dynamics could not address the

problems raised at the first hearing. (SOAR Exs. 46 and 53). On May 27, 2011 IDOT released the “Analysis of Urban Airwake Effects on Heliport Operations at the Chicago Children’s Memorial Hospital”, a post-hearing report prepared by Joseph F. Horn and others (“Horn Report”). This report was a primary subject of the June 23 - 24, 2011 IDOT hearing.

D. June 23 - 24, 2011 Hearing

At the June 2011 hearing SOAR presented several witnesses including Mr. Richard Porter, Esq., along with Dr. Thomas Corke, Ph.D., and Dr. Patrick Veillette, Ph.D. both of whom reviewed the Horn Report along with supplemental materials provided to them at their request.

Even if the Horn Report had been properly submitted prior to the conclusion of the evidentiary hearing in July 2009, its findings and conclusions give rise to grave concerns as to the methods used in the study, the accuracy of wind information that pilots might receive at the heliport, and the proposed escape routes contained in the application for the proposed heliport.

1. Mr. Richard Porter, Esq.

Mr. Porter stated, “The Horn report does not intend to answer the question of whether it is safe to operate a heliport at this location and offers no opinion on that issue”. (6/23/11, pg. 19). He indicated that both Dr. Corke and Dr. Veillette would demonstrate how Continuum Dynamics, Inc. and Dr. Horn failed to deliver a work product in accordance with their contractual obligations. Specifically, how: a) Continuum Dynamics, Inc. (CDI) failed to verify the Streeterville wind simulation (also referred to as the CFD); b) CDI failed to provide accuracy bounds for calculations and predictions; c) Dr. Horn failed to integrate a validated Streeterville wind simulation into his work and d)

Dr. Horn failed to analyze the efficacy of the proposed wind measurement system (the Super AWOS) for predicting dangerous wind conditions. (6/23/11, pgs. 19-25, SOAR Exs. 96 pg. 3 and 97 pg. 3)

2. Dr. Thomas Corke, Ph.D.

Per Dr. Corke, the Horn Report failed to meet professional standards for verification and validation. He found that report's results and conclusions "are unsubstantiable" indicating "there is still no guarantee that the proposed Children's Memorial Hospital helipad will be safe at any wind speed", and that the complete wind tunnel study needed for CMH's location was never conducted. (SOAR Ex. 47, pg. 16).

Dr. Corke explained that the wind simulation used by the Horn Report fails all standards for quantitative verification and is not suitable to provide predictive wind velocity input to the helicopter flight model. (Tr. 6/24/11, pg. 34). Dr. Corke determined that verification of the Streeterville wind simulation was not achieved as was acknowledged in an admission on page 100 of the report. *Id.* The authors apparently attempted to verify the wind simulation but admitted they did not reach the critical result whereby the simulation results stop changing as the grid spacing is made smaller. *Id.* Furthermore, for some reason the authors' attempt at verification did not include the CMH building in its site geometry and was only done for a single northwest wind direction. (SOAR Ex. 47; Tr. 6/24/11, pg. 34).

Dr. Corke explained that even if the Streeterville wind simulation had been quantitatively verified (which it was not), engineering standards require it also be validated against a known solution. (Tr. 6/24/11, pg. 35). The Horn Report chose the RWDI wind tunnel experiment as the known solution for validation of the wind simulation. (Tr. 6/23/11, pt. 67).

Dr. Keller, a co-author of the Horn Report testified about this comparison at the June 2011 hearing. Showing comparison graphs of data between the Streeterville wind simulation and the RWDI data he acknowledged “And as you can see we’re not even close here”. (Tr. 6/23/11, pg. 69)

After plotting the percentage of error between the wind simulation and RWDI wind tunnel tests, Dr. Corke also found that the wind simulation consistently **under-predicted the mean horizontal wind component by a maximum of 43%** and an average of 25% from the lowest point above the heliport to an elevation of 60 feet. He found that the simulation consistently **under-predicted the horizontal gust levels by a maximum of 102%** and an average amount of 50% from the lowest point above the heliport to an elevation of 60 feet. (Tr. 6/24/11, pg. 38; SOAR Ex. 47, pg. 6-7; SOAR Ex. 48, pg. 19).

Dr. Corke also compared the vertical mean and fluctuating vertical wind components from Table 6.3-4 on page 85 of the Horn Report with RWDI’s data. He found that the Streeterville wind simulation **under-predicted the mean vertical wind component by 1701%** for the northwest wind direction and by **941%** for the west wind direction. A 1,701% under-prediction in this instance means that RWDI wind tunnel experiment predicted the wind velocity to be 27 times greater than what was measured in the Streeterville wind simulation. He also pointed out that the simulation predicted the vertical wind component to be downward while the RWDI experiment predicted the wind upward. (Tr. 6/24/11, pg. 34; SOAR Ex. 47, pg. 7; SOAR Ex. 48, pg. 20).

Performing the same analysis for the peak gust spread for the vertical wind component above the heliport he determined that the Streeterville wind simulation

under-predicted this component by 1,125% for northwest winds and by **1,010%** for westerly winds. (Tr. 6/24/11, pg. 40; SOAR Ex. 47, pg. 7; SOAR Ex. 48, pg. 21).

Dr. Corke then evaluated the Streeterville wind simulation with the RWDI data for a flight path. This comparison showed an **under-prediction of the mean vertical wind speed by an average of 983%** and an over-prediction of the mean horizontal wind speed by an average of **911%**. He explained that the over-prediction in this case was not conservative because it actually reduces the error in the vertical wind speed when compared to the RWDI data. (Tr. 6/24/11, pgs. 4-42; SOAR Ex. 47, pgs. 7-8; SOAR Ex. 48, pg. 22).

Dr. Corke showed that the flight dynamics model used in the Horn report was too simple to represent real world effects and the one-way coupling simulation and the helicopter pilot simulation may produce serious errors. He noted that Dr. Horn should have been aware of this in his work, as Dr. Horn was co-author of the paper that highlighted this issue. (Tr. 6/23/11, pgs. 45-46; SOAR Ex. 48, pg. 26; SOAR Ex. 47, pg. 8). Dr. Corke showed that there was no sensitivity study of the pilot model. (Tr. 6/24/11, pgs. 46-47; SOAR Ex. 48, pg. 32). Additionally, the helicopter simulation did not include variations in the engine dynamic behavior or changes in the flight control system response or authority. (Tr. 6/24/11, pgs. 42-45; SOAR Ex. 48, pg. 25; SOAR Ex. 47, pgs. 8-9).

As Dr. Corke noted, the Horn Report authors acknowledged they did not perform verification for the helicopter simulation. The lack of quantitative verification is itself sufficient ground to disregard the prediction from the helicopter/pilot simulation. (Tr. 6/24/11, pg. 47; SOAR Ex. 48, pg. 28; SOAR Ex. 47, p. 9). The authors also did not

achieve validation of the helicopter/pilot flight simulation. Dr. Corke computed the errors between the simulation predictions and the actual helicopter flight data for the doublet response tests. He found that the majority of the deviations exceeded the stated average uncertainty in the GPS position indicator on the helicopter and, as such, are real validation errors. (Tr. 6/24/11, pgs. 51-52). He explained how the errors increased, sometimes significantly, during hover, one of the most critical phases of landing on the heliport. (Tr. 6/24/11, pg. 49; SOAR Ex. 48, pgs. 33-35; SOAR Ex. 47, pgs. 9-10).

Using the data contained in Figures 5.4-4 through 5.4-14 in the Horn Report, Dr. Corke compared the helicopter/flight simulation predictions to the test flights. He found that the magnitude of error between the helicopter flight simulation and the actual helicopter flight test data for the southeast approach was approximately **twice as high** as those from the doublet tests. The magnitude of error for the northeast approach was in some cases **twice the magnitude** of error as those from the southeast approach. (Tr. 6/24/11, pgs. 55; SOAR Ex. 48, pgs. 33-34; SOAR Ex. 47, pgs. 11-12).

Ultimately, Dr. Corke calculated the actual margin of error of the simulation predictions. (Tr. 6/24/11, pgs. 55-56). He applied this error to the Streeterville helicopter/flight simulation predictions and found that the error bars masked the dynamic range of the flight control predictions, rendering the predictions invalid. (Tr. 6/24/11, pg. 56; SOAR Ex. 48, pg. 37; SOAR Ex. 47, pg. 15). He further demonstrated that when the error bars were applied, flight control predictions were pushed to and beyond their limits. (Tr. 6/24/11, pgs. 57-59; SOAR Ex. 48, pg. 38)

As to the AWOS Dr. Corke pointed out that the Horn Report did not take into consideration the sensitivity, accuracy or frequency response or the ability of the AWOS

to measure mean wind speed, gust spread and wind shear. In reality the report only considered the mean horizontal wind component and utilized improperly scaled Streeterville wind simulation predictions. (Tr. 6/24/11, pgs. 61-62; SOAR Ex. 48, pg. 16). Dr. Corke agreed with the Horn's Report statement that "wind measurements will not only vary with location on the rooftop, but will vary in day to day measurements". (Tr. 6/24/11, pgs. 61-62). He pointed out that there is still no evidence that the open terrain algorithm used by the AWOS, is effective for an urban setting. Dr. Corke raised the still unanswered questions as to the number of AWOS systems needed and their placement, the accuracy required from the device, and the device's capability to achieve that accuracy. (Tr. 6/24/11, pgs. 61-62; SOAR Ex. 48, pgs. 41).

3. Dr. Patrick Veillette, Ph.D.

Dr. Patrick Veillette stated that the Horn Report cannot be used by IDOT or anyone else to determine that the proposed heliport can be operated safely as: a) even under the ideal conditions simulated, the Horn Report finds relatively intense pilot workload and control/power margins that near the acceptable limit of operations; b) the overall simulation was not conservative nor did it test real-world variables; c) the assumption that an aborted and repeated approach can be accomplished safely is dangerous; d) the required weather station was not proven to provide pilots with critical wind information needed to judge safe flight conditions; and e) the flight tests proposed, given the above, would be reckless. (Tr. 6/24/11, pgs. 68-69; SOAR Ex. 52, pg. 6; SOAR Ex. 51, pg. 1).

Even under the ideal conditions simulated in the Horn Report, problems surfaced including high pilot workload and pilot control margins and power margins nearing acceptable limits. (See Horn Report Conclusions, 6 & 7, pg. 90). Dr. Veillette testified

that pilot workload, a critical safety factor, was too narrowly defined and should have been more realistically represented by including increased complexities, mental work load, memory loads, problem solving, hazard detection, and the particular environment. (Tr. 6/24/11, pgs. 70-71; SOAR Ex. 52, pg. 8). Dr. Veillette further identified that there was no uncertainty factored into the pilot control margins and power margins, rendering the true effect on these measures unknown. (Tr. 6/24/11, pgs. 71-72; SOAR Ex. 52, pgs. 8-9; SOAR Ex. 51, pg. 2).

Dr. Veillette testified that the overall simulation was not conservative and did not test real-world basic variables including: varying wind conditions, a non-optimal pilot, pilots working from inaccurate wind information or deviating from a prescribed trajectory, takeoffs, propensity for Loss of Control States, equipment problems, or even a range of operating conditions or temperatures. (Tr. 6/24/11, pgs. 72-78; SOAR Ex. 52, pg. 11; SOAR Ex. 51, pgs. 2-5).

Horn Report recommendation #1 was challenged by Dr. Veillette who stated that the proposed unscientific 5-knot reduction of the mean wind speed operational limit gave uninformed readers a false sense of security. The arbitrary reduction was proposed without basic real-world variables being tested, and without actual calculation of modeling uncertainties and approximations. Simulations were not even run to see the effect of the proposed 20-knot mean wind speed. He pointed to Dr. Horn's testimony at the hearing in which Dr. Horn confessed that an actual flight test flown at the 20-knot level showed significant downdrafts and torque limits that hit operational limits. (Tr. 6/24/11, pgs. 76-80; SOAR Ex. 52, pgs. 13-14, SOAR Ex. 51, pgs. 5-6).

Dr. Veillette testified that Horn Report conclusion #6 (i.e., that an aborted and repeated approach could be accomplished safely) was dangerous. He pointed out that an assumption was made by the Horn Report authors that aborted and repeated approaches were possible though no aborted path had been identified or simulated. He outlined how the Horn report stated that a) the most common easterly approach to the heliport would be when winds were from the west; b) the AWOS has accuracy problems with westerly winds and significantly under-predicts the wind speeds; c) westerly winds can create high pilot workload due to increased turbulence; d) under high pilot workload pilots may need to abort and repeat approach; e) the statement in the report that “there is no indication that the pilot could not abort and repeat the approach” was made without any investigation or corroboration. (Tr. 6/24/11, pgs. 81-82; SOAR Ex. 52, pgs. 16-18).

Showing a diagram from the CMH Heliport Operations Power Point submitted to IDOT on 11/23/09, Dr. Veillette explained that the arrows on the aerial map of Streeterville were CMH’s depiction of the escape routes for rejected or aborted landings for the most common easterly approach to the heliport. (SOAR Ex. 52, pg. 19). He pointed out that the rejected landing path for the preferred east approach shows the arrow going directly into Water Tower Place, an 859-foot high-rise, 439-feet taller than the proposed heliport at a horizontal distance of only 528-feet away from the heliport. (Tr. 6/24/11, pgs. 82-87; SOAR Ex. 52, pgs. 20-21; SOAR Ex. 51, pgs. 6-7). He explained that a pilot may not simply pull-up and continue straight (west) as this would result in a collision with the Olympia Center high-rise. He also explained (without any disagreement from CMH) that if an approach from the east is aborted it is most likely that a pilot will need to turn to his right (north) to avoid the elevator shaft which is positioned

above the heliport on the CMH roof. (Tr. 6/24/11, pgs. 82-83). Unfortunately, that route also results in a direct collision with Water Tower Place. (*Id.*; SOAR Ex. 52, pg. 22). Dr. Veillette testified (again without any disagreement from CMH or IDOT) that a pilot will not be able to ascend quickly enough to clear Water Tower Place. (Tr. 6/24/11 at pg. 85). **Therefore, if a pilot has to abort from the predominant wind direction and follows the CMH proposed escape route he will collide with Water Tower Place.**

In 2006, CMH was made aware by IDOT that winds at the proposed facility are a concern, that a standard windsock would be insufficient, and that a weather station is required. Dr. Veillette highlighted that CMH at that time put forth the AWOS as its solution to this requirement. (SOAR Ex. 54, pg. 21; SOAR Ex. 52, pg. 23; SOAR Ex. 51, pg. 7) Dr. Veillette restated CMH's July 2009 testimony from Mr. Alexander, which showed the absolute need to have site-specific information and CMH's intent to provide it. (Tr. 6/24/11, pgs. 87-88; Tr. 7/22/09, pgs. 27-28, 120)

Dr. Veillette highlighted testimony from a representative of the AWOS manufacturer the previous evening that: a) wind speed/direction can "vary significantly based on geography and elevation"; b) Midway and O'Hare data cannot be relied upon to predict wind conditions at the heliport as the data is updated hourly and that there can be significant differences in the Midway and O'Hare data at the same time; and c) the AWOS system is unreliable on the hospital roof particularly for the predominant westerly wind conditions and may broadcast a message indicating that "AWOS winds are currently intermittent and unreliable". (Tr. 6/24/11, pgs. 88-89).

While concurring that pilots must not guess about the wind conditions in Streeterville, Dr. Veillette explained that there was only one conclusion in the Horn

report regarding the use of AWOS at the location. This was conclusion #9 which provides “There is potential for flow blockage effects to cause the proposed AWOS system to under predict the free stream winds at the altitude of the heliport”. (Tr. 6/24/11, pg. 89; SOAR Ex. 125, Response to Question #11). Further, the Horn Report found that “[f]or the west wind cases the free stream wind away from the heliport is likely to be substantially higher than measured on CMH rooftop”. (Tr. 6/24/11, pgs. 89-90; SOAR Ex. 52, pg. 17) (citing Horn Report, pg. 8). Given conclusion #9 Dr. Veillette explained that the Horn Report’s recommendations #1 (i.e., operating limits as measured by either the heliport AWOS or a ground facility) and #2 (i.e., basing operational status on the higher wind value measured at the heliport or ground location), when it has been shown that neither source will provide accurate information, are reckless. (Tr. 6/24/11, pgs. 89-90; SOAR Ex. 52, pg. 27, SOAR Ex. 51, pg. 8).

Dr. Veillette testified that the Horn Report’s recommendations #4 (i.e., flight testing to expand the operational envelope) and #5 (conducting flight tests at a mean wind-speed of 25 knots) are also reckless. He noted that the Navy learned when operational limits were reached when an accident occurred, and that such a testing strategy in Streeterville is unacceptable and dangerous. He also stated that the aviation industry does not recognize the lack of an accident as an indicator or predictor of safety.

He pointed out that the a) simulations did not account for real world situations; b) model’s uncertainties and approximations were never calculated; and c) without a proven weather station pilots would be left to guess at site conditions. (Tr. 6/24/11, pgs. 90-91; SOAR Ex. 52, pg. 28; SOAR Ex. 51, pg. 8).

Dr. Veillette concluded that IDOT must deny the hospital's heliport application on the basis that the hospital has a) been unable to identify emergency landing locations along even the proposed flight paths to/from the heliport or at the heliports; and b) the documented rejected landing approach is directly into the high rise building, Water Tower Place. Combining this knowledge with all of the other safety concerns presented, including the inability to predict the swirling winds at the proposed location, Dr. Veillette requested that the heliport application be denied. (Tr. 6/24/11, pgs. 91-92; SOAR Ex. 52, pg. 30; SOAR Ex. 51, pg. 9).

4. Dr. Joseph Horn, Ph.D. and Dr. Jeffrey Keller Ph.D.

Dr. Horn indicated that his team was tasked by IDOT with conducting an independent study of the airwake effect at the heliport, and outlined their contractual scope of work. (Tr. 6/23/11, pg. 39). "So we worked with IDOT to define a Statement of Work that was a reasonable scope of effort that we could do within a reasonable time within a reasonable level of resources." (Tr. 6/23/11, pg. 39). Throughout their testimony both Dr. Horn and Dr. Keller indicated where relevant work had not been done or was outside of scope (Tr. 6/23/11, pgs. 35, 42-43, 82-83, 85, 87), that the information provided for comparison was limited (Tr. 6/23/11, pg. 67), that there were under-predictions, uncertainty, and error (Tr. 6/23/11, pgs. 69, 110, 111, 113, 188), that error was not calculated (Tr., 6/23/11, pg. 179), and that they had no idea as to acceptable levels of error (Tr. 6/23/11, pg. 180, 188). Dr. Horn also admitted and recommended that the AWOS measurement accuracy needed to be further investigated. (Horn Power Point Slide, 87).

In an email Dr. Horn indicated to IDOT that "in order to gather meaningful data we will need wind measurement data from the heliport on the hospital from the dates of

the test.”¹ When asked at the hearing about the mean wind speed at the heliport when the flight tests were performed, Dr. Horn admitted that winds are local and that one cannot determine exactly what the winds are at the heliport. (Tr. 6/23/11, pgs. 184-185). Therefore Dr. Horn did not have the information required to gather meaningful data.

Dr. Horn also admitted that the team’s “task was to study the effect of airwake on the helicopter and to determine if it creates any unusual or what we’d expect to be unsafe conditions, but there’s many other factors that affect safety of the heliport.” *Id.* pg. 183. He further indicated that the team’s “report needs to be judged in the context of all other aspects of the heliport. So it’s one piece of data in the final determination of whether” the heliport can be approved. *Id.* at 183-184.

5. CMH

Even though CMH’s wind consultants RWDI did not testify, CMH CEO Mr. Patrick Magoon stated that CMH is “pleased that this extensive, comprehensive and independent analysis confirms our experts’ finding. We believe that this study supports our institution’s conclusion that a heliport can be safely operated on the roof of Lurie Children’s.” *Id.* pg. 120. Mr. Magoon asked IDOT to approve the application prior to CMH testing a variety of factors impacting the safety of the proposed heliport. *Id.* pgs. 121-122.

Despite Drs. Horn and Keller testifying that their report focused solely on the effect of airwake on the helicopter, Mr. Alexander testified that the same report was “one of the most extensive, far reaching reports I have ever seen in my career in helicopters

¹ This May 6, 2011 email was posted on the IDOT website after the June 23-24, 2011 hearing concluded.

and in aviation.” *Id.* pg. 123. He indicated that CMH wanted to do more flight tests and that pilots have “freedom in choosing their approach path”. *Id.* pgs. 119-130.

Ms. Stephanie Haynes, a representative from the proposed AWOS manufacturer testified that when a pilot is preparing a flight plan, a pilot might have outdated information if he is only looking at reports from O’Hare and Midway. She further testified, “it’s important to note, especially in this type of geography, that, if we are looking at observations from O’Hare and Midway, there are probably going to be some differences in the meteorological conditions just based on the geography of the city” and that due to lake effect weather, a heliport in downtown Chicago is “going to be experiencing some different weather phenomena than a system at O’Hare and Midway”. *Id.* pgs. 159-160.

She elaborated saying that the AWOS temperature/humidity sensor was important to pilots as “a high density altitude reading will actually reduce the aircraft performance”. *Id.* pg. 161. She acknowledged that wind speed and direction information is critical to aircraft performance for takeoffs and landings and that “this is something that can vary pretty considerably based on geography”. She further elaborated that “when looking at a rooftop heliport... there are likely to be some pretty large fluctuations between the wind speeds, especially at the elevation of the building as opposed to a ground observation”. *Id.* pg 163. She emphasized that it is important for a pilot planning a flight to have information from a local reporting source. *Id.* pg. 164.

She discussed the AWOS visibility sensor and its role in determining whether a flight needed to be conducted under VFR (Visual Flight Rules) or IFR (Instrument Flight Rules). She elaborated that visibility can differ “significantly based on geography, and

especially in this case where you can have fog from the lake and also where you can have low laying clouds that would impact the heliport, but maybe not a ground-based system”. *Id.* pg. 165. She continued by explaining that AWOS data related to cloud height and cloud cover would also be “used to determine VFR versus IFR conditions; and, again, it can vary quite a bit based on geography”. *Id.* pg. 168. She also discussed the present weather sensor indicating that its measurements “would be important for pilots to have information on to the point where they are actually landing the aircraft”. *Id.* pg. 168.

Ms. Haynes indicated that there are “buildings within the FAA mandated distance that could cause a wind obstruction depending on which direction the winds are coming from” *Id.* pg. 171 and that while “we tried to follow the FAA [citing] criteria as closely as possible, there are some buildings to the west that could potentially cause obstructions in certain conditions”. *Id.* pg. 172. She followed this testimony by playing a recorded message from the AWOS, which stated “AWOS winds are currently intermittent and unreliable”. *Id.* pg. 173.

6. Mr. Ray Syms

Mr. Syms was never disclosed to SOAR by IDOT as a testifying witness for the July 2011 hearing even though IDOT apparently knew it intended to have him testify as early as January 24, 2011.² IDOT never mentioned his testimony in any calls to discuss the scheduling and witness testimony for the June 2011 hearing. As such, SOAR had no opportunity to prepare for his testimony in advance of or at the June 2011 hearing. It did not become apparent that Mr. Syms would be testifying until he began to load a

² This January 24, 2011 e-mail was placed on the IDOT website after the June 24, 2011 hearing concluded.

presentation on to the facility's computer on June 24, 2011. His testimony related primarily to a flight test IDOT performed the day the 2011 hearing commenced.

At the June 2011 hearing Mr. Syms indicated that he had attended the July 2009 hearing, and had read all of the documents put forward in relation to CMH's heliport application.

He stated that when he queried the National Safety Council regarding injuries of persons of the general public by helicopters or in the vicinity of heliports that there were none. (Ray Syms Presentation, p. 13). His testimony regarding his knowledge of the application material and his statements regarding injuries are inconsistent with the testimony of Madlyn Daniel at the July 2009 hearing in which she explicitly outlined injuries and death to innocent bystanders when a helicopter rotor was flung from the roof of the Pan Am Building in New York City. CMH counsel acknowledged this accident during his testimony in July 2009. (Tr. 7/25/09, p. 54).

In his June 2011 testimony, Mr. Syms indicated that he was a member of the FAA/Industry Heliport Design A/C working group and had written three of the last Advisory Circulars. (Tr. 6/24/11, pg. 3). He made assertions at the hearing that CMH's proposal meets both the current FAA guidelines (FAA AC 150/5390-2B) and 2011 FAA guidelines (FAA AC 150/5390-2C) currently under review.³

³ This is simply not the case. Both the current and under review guidelines recommend hospital heliports support instrument operation and future expansion. CMH's heliport cannot support instrument operation nor can it support future expansion. Both FAA circulars state, "When an AWOS is installed, it should be located at least 100 feet (30.5m) and not more than 700 feet (213m) from the TLOF perimeter. (AC 150/5390-2B 412e and AC 150/5390-2C 416d). Per the building plans submitted by CMH, and allegedly reviewed by Mr. Syms, CMH's proposed AWOS location does not meet the 30.5m minimum distance required for installation. Within the guidelines under review, the FAA has specifically added a new section 409 Heliport Protection Zone (HPZ) for hospital heliports which states, "It is recommended that a Heliport Protection Zone be established for each approach/departure surface. The HPZ is in the area under the 8:1 approach/departure surface starting at the FATO perimeter and extending out for a distance of 280 feet... The HPZ is intended to enhance the protection of people and property on the ground. This is achieved through heliport owner control over the HPZ. Such control includes clearing HPZ areas (and maintain them clear) of incompatible objects and activities. Land uses discouraged in the HPZ are

During his testimony, Mr. Syms referenced flights he conducted to the proposed heliport, including a June 2011 flight in which he landed at the facility. Even so, he was unable to identify any emergency landing areas along the ingress and egress routes to or at the heliport for purposes of takeoff and landing. (Tr. 6/24/11, pgs. 131-133).

7. Mr. Jerry Lay

Similar to Mr. Syms, Mr. Lay was never identified to SOAR by IDOT as a witness for the July 2011 hearing. IDOT never mentioned his testimony in any calls to discuss the scheduling and witness testimony for the June 2011 hearing. As such, SOAR had no opportunity to prepare for his testimony in advance of or at the June 2011 hearing. It did not become apparent that Mr. Lay would be testifying until the hearing commenced on June 24, 2011.

On June 23, 2011 Mr. Lay admitted to landing a helicopter at the heliport.⁴ (Tr. 6/24/11, pg. 122). Similar to Mr. Syms, Mr. Lay was unable to identify any emergency landing areas along the ingress and egress routes to or at the heliport for purposes of takeoff and landing. (Tr. 6/24/11, pgs. 131-137).

residences and places of public assembly. (Churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of person typify places of public assembly). As Mr. Syms has physically visited the proposed heliport site on numerous occasions, he must be aware that CMH is not in control of its HPZ and that within CMH's 280 foot HPZ, there is a hospital, an office building, a hotel, a parking garage, a children's playground/park and a museum. The FAA clearly understands the need for clear areas at ground level, for safe hospital heliport operations.

⁴ As the purpose of the IDOT hearings was to approve or disapprove operation of the proposed heliport, Mr. Lay violated City of Chicago Municipal Code Article III Heliports (10-36-390) which states, "it shall be unlawful for the owner or person in control of any property, to install, maintain or operate thereon, a heliport as defined herein without first having obtained a license therefore". He may also have violated Section 47 of the Illinois Aeronautics Act which states, "It shall be unlawful for any municipality or other political subdivision, or officer or employee thereof, or for any person... to use or operate any airport or restricted landing area, for which a certificate of approval has not been issued by the Department".

E. June 25, 2011 – July 11, 2011

1. Dr. Joseph Horn/ Continuum Dynamics 7/8/11 Submission to IDOT

The authors of the Horn Report submitted a letter to IDOT on July 8, 2011.⁵ The authors still do not answer the question of whether it is safe to operate a heliport at this location and offer no opinion on that issue. It is clear the authors still fail to recognize that the Horn Report is being used inappropriately by IDOT and CMH to determine the safety of a proposed heliport and that real lives are at stake. In fact even before the public hearing, the report was advertised to the Streeterville community by CMH in its declaration that the heliport was safe. As noted below, the authors now refer to their work as a “preliminary estimate”. (Horn/CDI 7/8/11 Letter to IDOT, pg. 1).

The letter asserts that Drs. Corke and Veillette are suggesting a scope of work that is impossible, impractical or too costly to complete. The authors criticize Drs. Corke and Veillette for failing to take a constructive approach to a technical dialogue arguing, “the approach to resolving such disagreements typically involves peer review”. (Horn/CDI 7/8/11 Letter to IDOT, pg. 2).

Upon first learning of the authors’ effort, Drs. Corke and Veillette suggested the peer review process, and in August 2010 SOAR requested a meeting with the authors, SOAR experts, and CMH experts to get everyone to work together as it was “in everyone’s best interest that any further study adequately address the serious and significant safety issues and concerns with this [CMH’s] proposal and not come to erroneous or misleading results.” (SOAR Ex. 92, pgs. 2-3). As indicated by Mr. Porter, IDOT never responded to this invitation and apparently never informed the authors of

⁵ Detailed responses from Dr. Thomas Corke and Dr. Patrick Veillette to the Horn/Keller letter may be found in correspondence to SOAR which will be filed with IDOT simultaneously with this post-hearing brief.

this request. (Tr. 6/23/11, pgs. 25-26). IDOT bears responsibility for what subsequently transpired, not Drs. Corke and Veillette.

In this letter, the authors narrow their statement of work from that outlined in their contracts and presented as “reasonable” at the June 2011 hearing. At the June 2011 hearing, the authors described their statement of work saying they were tasked with objectives including, “conducting validation studies of” the CFD model, analyzing “approaches to the heliport and identify[ing] any cases where airwake turbulence causes issues with control and power margins and workload”, and “analyzing the proposed wind measurement system”. (6/23/11 Tr., pgs. 39-40; Horn Power Point, pg. 11)

The authors now further retract their scope of work saying, “The objective of our study was to perform research of the wind effects (urban airwake) to support a preliminary estimate of operational risks (due to winds/turbulent conditions) associated with flying to the helipad along the proposed flight paths”. (Horn/CDI 7/8/11 Letter to IDOT, pg. 2).

The authors do not dispute Dr. Corke’s findings regarding the impact of their choice of an inviscid model on the accuracy of their predictions, nor do the authors dispute Dr. Corke’s conclusions that the Streeterville wind simulation (also referred to as the CFD) was not verified or validated. The authors concede the quality of their work stating, “It is not disputed that the CFD airwake model does not perfectly match the wind tunnel data” and “Some of the specific criticisms are valid in the sense that the predicted flow does not perfectly capture measured wind fields”. (Horn/CDI 7/8/11 Letter to IDOT, pg. 3).

The authors make no attempt to define the accuracy bounds (of the Streeterville wind simulation) for subsequent calculations or predictions. Without the validation and definition of accuracy bounds, Continuum Dynamics, Inc. did not fulfill its contractual obligations with IDOT (SOAR Ex. 96, pg. 3), resulting in Dr. Horn's failure to use a validated CFD model in his work as specified in his contractual obligations with IDOT. (SOAR Ex. 97, pg. 3).

The authors take issue with the transparent approach used by Dr. Corke to calculate error. While another approach may be used, the fundamental fact is that the authors still made no attempt to quantify errors or uncertainty - via any method - of the flight simulation predictions.

The limited number of flight tests coupled with un-simulated wind conditions caused the authors to utilize a turbulence substitute in their flight simulations. A limited set of flight tests were then performed that encompassed a small fraction of the possible wind conditions. This number was too small to statistically remove the effect of random error. Although the authors had the means to do so, a quantitative comparison between the flight tests and the flight simulations was not performed. As a result, there was no uncertainty analysis presented.

The authors do not dispute Dr. Veillette's conclusion that their assumption that an aborted and repeated approach can be accomplished safely is dangerous, or that CMH's acknowledged rejected landing approach for the preferred easterly approach is into a high-rise. They authors also do not dispute Dr. Veillette's conclusions that: a) pilot workload was too narrowly defined, should have been more realistic, and was underestimated; b) they never factored uncertainty into the pilot control margins and

power margin values measured and c) that the proposed 5-knot reduction in operating limits was arbitrary and left untested. (Horn/CDI 7/8/11 Letter to IDOT, pgs. 9-11); d) they do not refute the importance of testing real-world variables but appear to take issue with the level of effort required to do this.

Drs. Horn and Keller do not dispute Drs. Corke and Veillette's conclusions that the authors had no knowledge as to how the AWOS actually works, or that the AWOS is an unproven device likely to provide pilots with inaccurate information by which to judge safe flight conditions. They do not refute Dr. Veillette's conclusion that Horn Report recommendations #1 (i.e., using lower operating limits as measured by either the heliport AWOS or a ground facility) and #2 (i.e., basing operational status on the higher wind value measured at the heliport or ground location) are reckless without having a proven device.

Again, Dr. Horn failed to meet a critical contractual obligation to "analyze the efficacy of the proposed wind measurement system (the Super AWOS) for predicting dangerous wind conditions". (SOAR Ex. 97, pg. 3).

The authors still push for flight-tests, failing to acknowledge the risk to Streeterville and the lack of a proven weather station to provide pilots basic, required information. (Horn/CDI 7/8/11 Letter to IDOT, pgs. 9-10).

2. Dr. Michael Selig 7/11/11 Submission to IDOT

Dr. Michael Selig sent a letter to IDOT on July 11, 2011. In this letter he refers to only having read the Horn Report and having sat through the IDOT public hearings. He makes no assertions that he has actually read, reviewed, or analyzed any information put forth by SOAR or CMH in relation to the Horn Report or any other application materials, supplements, testimony or evidence.

He concedes that there are issues “with certain details of the necessary engineering approximations and assumptions” yet makes no attempt to document or quantify these details in any way. He randomly states that “more study and more refinement would not lead to substantially different conclusions” but offers no substantiation or analysis for that assertion. (7/11/11 Letter from Dr. Selig to IDOT) This is inconsistent with what the authors of the Horn report acknowledge themselves in statements such as, “Full reconciliation of the measurements with the computations could be quite instructive”. (Horn/CDI 7/8/11 Letter to IDOT, pg. 3)

Dr. Selig incorrectly states, “if the authors submitted it for journal publication in abbreviated form it would likely be accepted by any of the leading peer-reviewed aerospace engineering journals”. (7/11/11 Letter from Dr. Selig to IDOT).⁶

III. BURDEN OF PROOF

SOAR reiterates its position that this matter is a “contested case” as defined in the Illinois Administrative Procedures Act, and that, unless otherwise provided by law or stated in the agency’s rules, the standard of proof to be met by the applicant in presenting its application is the preponderance of the evidence. (Illinois Administrative Procedure Act 5 ILCS 100/10-15).

⁶ This statement displays belies his poor understanding of the basic requirements outlined by journals for publication acceptance. Journals do require error and uncertainty to be calculated and explained prior to a paper being submitted – something the Horn Report never did. The policy statement for the journals of the AIAA require numerical and experimental accuracy, specifically stating, “The AIAA journals will not accept for publication any paper reporting (1) numerical solutions of an engineering problem that fails adequately to address accuracy of the computed results or (2) experimental results unless the accuracy of the data is adequately presented. Similarly, the policy statement for the Journal of the American Helicopter Society states, “Submitted manuscripts should meet the following criteria: originality, clarity of technical writing, documented methods of approach, validity of measured or computed data (including sources of uncertainty), and conclusions that are supported by the data.

IV. ARGUMENT

To protect the safety of the passengers of the helicopter flights, the residents and visitors of Streeterville, and the people near the possible flight paths, IDOT must deny CMH's heliport application.

A. No Emergency Landing Areas

There are no available emergency landing areas in violation of City of Chicago Municipal Code. City of Chicago Municipal Code Title 10, Article III Heliports, Section 10-36-380 provides, "No helicopter may take off or land from a heliport unless areas are available from any point necessary for that takeoff or landing to allow an emergency landing to be made without undue hazard to passengers or persons or property on the surface. For this purpose, areas such as schoolyards, parking lots, recreation areas, highways, shopping centers, and public docks are not considered available for possible emergency use...."

Section 10-36-420 of the code provides that an application must be filed to obtain a license for a heliport and that the application must specify "a copy of the map showing the intended routes of ingress thereto, and egress therefrom, including intended emergency landing areas..."

IDOT was made aware of the aforementioned Code requirements in advance of issuing the order on April 23, 2009 for Docket #08-08 for the Proposed Heliport. After the July 2009 hearing at which these code requirements were reiterated, IDOT's Ms. Ellen Schanzle-Haskins sent a letter to Mr. Farkas and Mr. George dated August 5, 2009 asking CMH to provide "emergency procedures in both landing and takeoff operations".

Mr. Alexander testified at the July 2009 hearing, "I don't think the people of Chicago would like it if we took a bulldozer and made an open area every ten feet. It's

impossible to identify those locations where an emergency would have to take place.” (Tr. 7/22/09, pg. 146).

CMH has consistently failed in its application, in its supplemental submissions, and in its testimony at either the 2009 or 2011 hearing to identify any emergency landing areas for takeoffs and landings or along the ingress and egress routes. **The Dime Pier heliport will not meet the requirements specified by the City’s code as it is not available at any point necessary for takeoff or landing.** (Chicago Municipal code, 10-36-380.)

The FAA has recognized the importance of having unobstructed clearance zones at ground level for each approach/departure surface for hospital heliports. As such, draft AC 15/-5390-2C Section 409⁷ includes the provision for a Heliport Protection Zone (HPZ) for hospital heliports.

Mr. Doub and Dr. Veillette each testified that there are no emergency landing areas in Streeterville and a review of the aerial view of the area surrounding the heliport confirms the lack of any suitable emergency landing area. (SOAR Ex. 2, pg. 16). Their assessments were further confirmed at the July 2011 hearing when four pilots (i.e., Mr. Syms, Mr. Lay, Mr. Alexander and Dr. Veillette) were asked to identify emergency landing areas. Not one of the pilots could identify specific emergency landing areas at the heliport or along the ingress and egress routes. (Tr. 7/24/2011, pgs. 131-137).

⁷ It is recommended that a Heliport Protection Zone be established for each approach/departure surface. The HPZ is in the area under the 8:1 approach/departure surface starting at the FATO perimeter and extending out for a distance of 280 feet... The HPZ is intended to enhance the protection of people and property on the ground. This is achieved through heliport owner control over the HPZ. Such control includes clearing HPZ areas (and maintain them clear) of incompatible objects and activities. Land uses discouraged in the HPZ are residences and places of public assembly. (Churches, schools, hospitals, office buildings, shopping centers and other uses with similar concentrations of person typify places of public assembly).

Mr. George stated at the beginning of the July 2009 hearing, "It was pointed out at the Plan Commission that the opportunity to obtain a license for this location would be the subject of further hearings by the Illinois Department of Transportation". (Tr. 7/22/09, pg. 18-19). CMH clearly indicated that licensing was subject to IDOT's proceedings.

Aviation Safety Rules Section require IDOT to consider 1) the heliport's proposed location, and 6) the nature of the terrain. Locating a heliport in a densely populated urban area without the required emergency landing areas would put persons and property at severe risk. On this basis, and because the heliport cannot be licensed by the City of Chicago, IDOT must reject CMH's heliport application.

Additionally, as Dr. Veillette testified, section 8-213 of "the FAA Aviation Inspector's Handbook indicates that the approach and takeoff paths should avoid congested areas, heavily populated urban areas, or environmentally sensitive areas". (SOAR Ex. 2, pg. 12; Tr. 7/23/09, pg. 67) This criterion can simply not be met by CMH's proposal to operate a heliport in Streeterville.

B. Rejected Landing Approach into a High-Rise and into Avoid Areas

After the July 2009 hearing, IDOT required CMH to depict approach/departure arcs and "options to be used in the event of a rejected landing or 'missed approach'" (SOAR Ex. 60).

In its November 23, 2009 response CMH submitted a diagram for what experts agree is the most common approach to the heliport from the east. This approach will be used when pilots align the helicopter into the predominant west winds. CMH submitted another diagram for the easterly approach showing rejected landing paths also known as escape routes. (SOAR Ex. 52, pg. 21).

The CMH rejected landing/escape route diagram depicts that a pilot may turn to his left (south) or right (north) to escape a rejected approach from the east. The pilot may not simply pull-up and continue west as such would result in a collision with the Olympia Center high-rise. For this common east approach, if a pilot needs to abort the approach, pilots will likely turn right (north) to avoid the elevator shaft which is positioned above the heliport on the CMH roof. (Tr. 7/23/09, pgs. 82-83). Unfortunately, that route also results in a direct collision with Water Tower Place, a building 439 feet higher than the heliport and only 528 feet away. A pilot will simply not be able to ascend quickly enough to clear Water Tower Place putting its occupants and those nearby in serious jeopardy.

Within CMH's November 23, 2009 supplemental submission to IDOT, CMH also depicted "avoid areas". Avoid Areas were defined to be "the area to the north, northwest, west, and southwest of Lurie Children's" to be avoided "due to the height of obstructions and the possibility of wind shear and turbulence in the vicinity of those buildings within the area." (CMH Heliport Operations Power Point submitted to IDOT 11/23/09). CMH stated, "approaches and departures should not be attempted through this area". *Id.* Both the left (south) and right (north) rejected landing paths submitted by CMH for the east corridor arrivals, would take a pilot into these very "avoid areas" identified by "CMH" which unfortunately displays the lack of thoughtful consideration for this proposed heliport site.

Aviation Safety Rules Section 14.810(a) requires IDOT to consider 1) the heliport's proposed location, and 6) the nature of the terrain. (92 Ill.Admin.Code Ch. I Sec. 14.810(a)(2011) (SOAR Ex. 43). A proposed rejected landing approach into a high-

rise and proposed rejected landing approaches into areas the hospital has specifically stated pilots should avoid, obviously requires IDOT to deny CMH's application to protect public safety.

C. Still No Safety Study Nor Risk Analysis

Early on, Mr. Doub and Dr. Veillette indicated that a safety study and risk analysis needed to be performed for CMH's proposal. Dr. Veillette indicated that certain risks, if left unmitigated, would render the proposal unsafe including the: lack of any available escape routes, lack of any emergency landing areas, fact that the wind conditions are prime for loss of control states, and lack of any evidence that the AWOS could accurately predict winds. The 2009 hearing and 2011 hearing have proven there are no Streeterville emergency landing areas, and the escape routes documented by CMH lead directly into a collision with a high-rise and into areas pilots need to avoid. There is no evidence that the AWOS can accurately predict winds and to the contrary the IDOT's own consultants have found the AWOS substantially under-predicts wind speeds for the predominant wind direction. Finally, the wind conditions prime for loss of control states have never been studied.

In light of these severe, unmitigated risks, IDOT must deny CMH's heliport application.

Dr. Horn acknowledged at the June 2011 hearing that there are many factors that need to be considered in determining whether or not a heliport is safe which are not the subject of the Horn Report. CMH and IDOT's experts, however, now appear to be using the recent flight tests and landings as a means to justify the safety of the proposed heliport.

As Dr. Veillette testified to in July 2009 and June 2011, the aviation industry does not recognize lack of an accident as an indicator or predictor of safety. The fact that IDOT recklessly landed at the heliport knowing it had no information about the wind speeds and gusts at the heliport and along the flight path, does not in any way reduce the extreme risk. One need only have heard Dr. Horn's unsettled and concerned description of the test flight in which the pilot suddenly experienced significant downdrafts and torque limits that hit operational limits (which were not predicted by the Horn CFD study) to appreciate that lack of an accident does not mean something is safe. (Tr. 6/23/11, pgs. 112-113).

IDOT cannot approve CMH's heliport application on the basis of "lack of an accident" during flight-testing.

D. Accurate Wind and Weather Information are Needed for this Heliport and Flight Paths and the AWOS Cannot Provide Such Information

In 2006 CMH was made aware by IDOT that a weather station would be required for the proposed heliport. (Tr. 6/24/11, pg. 87; SOAR Ex. 54, pg. 4). In its heliport application to IDOT, CMH extolled the virtues of the AWOS. At the July 2009 hearing, CMH's Mr. Magoon stated that the AWOS would be installed to provide realtime information for pilot decision-making. CMH consultant Mr. Alexander highlighted that data from Midway and O'Hare could not be used, and stated the critical need for this device to prevent pilots from dangerously guessing conditions at the site. He further acknowledged that a pilot needs a 2-4 hour window of safe weather conditions in order to start a flight.

At the June 2011 hearing Ms. Stephanie Haynes stated more explicitly why a weather station was required for this proposal. She concurred with Mr. Alexander's

assessment that pilots could not rely on data from Midway or O'Hare to determine conditions at this site.

As was pointed out in previous testimony by Mr. Doub, the FAA's Advisory Circular requires that a hospital heliport be capable of instrument operations. (SOAR Ex. 17b). CMH acknowledged that its heliport was not set up for instrument operations due to the obstructions in this area and that its proposal is for a VFR-only operation. Therefore, a fundamental go/no-go decision for safe flight is based on whether conditions at the heliport are VFR or IFR. As Ms. Haynes testified for CMH, conditions that would necessitate an IFR vs. a VFR approach can vary based on geography. Lack of site-specific information will force a pilot to guess whether VFR or IFR flight rules should be applied. This is unacceptable.

Ms. Haynes highlighted a pilot's need for accurate information about wind speed and gust levels at the site, two key parameters in making a go/no-go decision, again emphasizing that this information would differ significantly with elevation and geography.

Experts agree that the Streeterville community is subjected to dramatic wind gusts, vortices, airwake, and wind shear, but none of the models used have provided any method or manner to accurately predict the wind conditions at the heliport or the flight paths. Experts agree that the wind speeds and gust spreads near the heliport must be known before an approach, landing, takeoff or departure, but the studies have proven that such information will not be available. This information is required for pilots to make a go/no-go decision about safe flight. Even IDOT's own consultant has found that the

AWOS will substantially under-predict the wind speeds when the winds are from the predominant direction.

During his testimony Mr. Syms stated “[a] pilot he understands what is going on, feeling what the wind is so doing he’s not a slave in any shape manner or form to what the AWOS says ...this AWOS is good for information but observation and judgment overrule what the AWOS says”. (MP3 File of Syms’ Testimony ~18:50). The hospital has stated specific operational criteria for pilots to use when making go/no-go decisions on flight. Experts agree that to make a decision and follow it through if a flight has begun, that wind information at the site and along the flight paths is highly critical. Mr. Syms’ suggestion that pilots make their own determination by “feeling” as opposed to using accurate data puts everyone onboard the helicopter and on the ground in serious jeopardy. It is this type of “hero-mentality” which is a recipe for disaster at this proposed location.

Now that CMH’s chosen device is unproven and even worse provides misleading information, CMH and IDOT’s experts appear to be backing off from this requirement, positioning a weather station as merely an enhancement or “nice to have” feature. IDOT must not remove this important requirement simply because it is now inconvenient for CMH.

The need for accurate wind information was not changed, CMH has failed to provide evidence that such information will be available, and thus the application must be denied.

E. The Horn Report Cannot be Used as a Basis for Any Conclusion that the Proposed Heliport May be Operated Safely

The evidence admitted at the June 2011 hearing established that the Horn Report was only a Computational Fluid Dynamics (CFD) computer model, which is merely qualitative and cannot be used as quantitative evidence upon which a safety determination can be made. Dr. Corke noted that the hospital's own consultant, RWDI, used a much more sophisticated computer simulation model (Virtualwind), but RWDI pointed out "It is important to be aware that the computational methods have some limitations and should not be used for detailed quantitative analysis in complex urban environments, which is best done with measurements during wind tunnel tests. (SOAR Ex. 57, page3) (emphasis added). Given this admission by RWDI and the exact same testimony from Dr. Corke, it is obvious that it would be negligent for IDOT to base any public safety decision on the Horn/Continuum Dynamics mathematical model.

Dr. Corke further proved the unreliability of this model at the hearing. It was explained that standard engineering practice requires that any simplified model, which is to be used to predict complex systems, be both verified and validated. Verification is a scientific process where a computer model is tested to determine if it is acting logically, for example through a grid independence study. It was undeniably proven (and admitted by Drs. Horn and Keller) that the CFD wind simulation of Continuum Dynamics failed to reach the critical result required to be verified by grid independence. (Horn Report, pg. 100). Furthermore, Dr. Horn admitted that there was no attempt to verify the helicopter flight simulation. (Tr. 6/24/11, pg. 47).

Not only did the authors of the Horn Report fail to verify the wind simulation or the flight simulation, the evidence was undeniable that the models could not be validated

when compared to the wind tunnel experiments or the flight tests. Validation is the engineering principal that requires a model to favorably compare to real life data or experimentation. Dr. Corke proved that the computer wind simulation dramatically under-predicted wind speeds when compared to the wind tunnel experiments. He found the horizontal wind speeds to be under-predicted by 43% and the gust levels by 102%. Furthermore, the vertical wind speeds were under-predicted by as much as 1701% and gusts by about 1000%. The wind speeds along the flight paths were also off when compared to the wind tunnel experiment by over 900%. These calculations of the error when compared to the wind tunnel tests were not, and cannot be disputed by Drs. Horn and Keller as they are mathematical facts. Therefore, IDOT must conclude that the wind simulation was not validated.

Likewise, when the helicopter flight simulation was compared to the actual flight test data, it was shown that the margin of error for the simulation was so great that it simply eclipsed all of the predictive results. In a rebuttal report submitted after the close of evidence (but during the public comment period) Drs. Horn and Keller again ignore the fact that the original contract with IDOT required them to determine the error bounds. Instead, they conveniently redefine the scope of their project as merely providing a “preliminary estimate of operational risks”. They once again fail to calculate the error bounds of their simulations. It would obviously be reckless for IDOT to rely on a study upon which the margin of error has not be determined by its own experts. Worse, in this case, the margin of error was calculated by the imminently well-qualified and respected Dr. Corke who found that the error is so great that it renders any findings meaningless.

Furthermore, as referenced above, the authors of the Horn report have admitted that the flight simulation model was highly simplified and ignored many of the real world variables. The Horn Report admits that even if only the simulated and under-predicted wind speeds are considered that there will still be “intense pilot workload” approaching the operable limits of a helicopter. This admission in the report itself should be enough for IDOT to find that CMH has not met its burden of proving that the heliport may be operated safely.

Finally, the Horn Report admits that the AWOS cannot predict the winds at the heliport or along the flight paths and actually finds that it will significantly under-predict the free-stream winds from the predominant westerly direction. Once again, given this admission, it is shocking that CMH would even elect to continue with this application or that IDOT would consider approving it.

When confronted with the obvious fact that the wind simulation cannot predict the winds and that the AWOS also cannot supply accurate information of wind speeds, the authors of the Horn report make one additional extremely dangerous assumption that a pilot will be free to abort a rejected approach. However, one of the only CMH proposed rejected approach paths for the dangerous and predominant westerly winds is directly into the side of Water Tower Place; a fact that Drs. Horn and Keller never address in their report and which they ignore again in their post hearing submission. These failures of the Horn Report establish that it is unreliable and does not support any finding that this heliport can be operated safely.

F. Incomplete and Inaccurate RWDI Obstruction Analysis Fails to Provide IDOT with Required Information

In the August 5, 2009 letter from IDOT attorney Ms. Ellen Schanzle-Haskins to CMH counsel Mr. Farkas and Mr. George, CMH was asked to present in “a plan view with outlines of any buildings *higher than the pad represented* and their top elevations to include all roof equipment, structures and antennas.” (SOAR Ex. 60) (Emphasis in original). Figure 1 from the RWDI June 6, 2007 report was to be used as the basis for this analysis. *Id.*

In the September 28, 2009 letter from RWDI to Bob McKenna from CMH submitted in response to IDOT’s query, RWDI provided an incomplete list of obstructions, ignoring high-rise obstructions in Figure 1 of the June 6, 2007 RWDI report including Water Tower Place, Olympia Centre, and the John Hancock building. (SOAR Exhibit 67, p. 3-4). Additionally, the data submitted by RWDI for this subsequent obstruction analysis used 425’ above ground level height for the heliport height. This is incorrect as the building plans submitted at the same time to IDOT show the above ground level height to be 410’ 2”.

Section 14.810 of The Aviation Safety Rules requires IDOT to consider: 5) whether the adjoining areas are free from obstructions based on a proper glide ratio and 8) the possibilities for future development.

As the obstruction analysis is both incomplete and in error, IDOT has no basis for determining whether the adjoining areas are free from obstruction based on a proper glide ratio, or the possibilities for future development.

G. FAA Advisory Circulars are Mandatory not Optional

At the July 2009 public hearing, Ms. Patty Frost alerted IDOT to the fact that CMH has acknowledged it has used federal funds in its construction project. AC 150/5390-2B 400 requires that “[i]f federal funds are used to build or modify a hospital heliport, the facility should meet the applicable sections in Chapter 2 as well as the additional recommendations in this chapter”. It is clear that CMH has not followed the requirement of the Advisory Circular that Section 400b of the Advisory Circular provides: “[p]ublic agencies and others planning to develop a hospital heliport are encouraged to select a site capable of supporting instrument operations, future expansion...”. This heliport does not support instrument operations and has no room for expansion. Section 412(e) provides “[w]hen an AWOS is installed, it should be located at least 100 feet (30.5m) and not more than 700 feet (213m) from the TLOF perimeter”. In this case, the proposed location of the AWOS is not between 100 and 700 feet of the TLOF perimeter.

If this Advisory Circular is mandatory then the application must fail. It is IDOT’s responsibility to determine if the federal funding used by CMH renders compliance with the Advisory Circular mandatory. There is no evidence that IDOT ever made this determination.

H. The Dime Pier Helistop available to CMH is Far Superior

Alderman Brendan Reilly testified at the July 2009 hearing that an alternative heliport, located approximately three-quarters of a mile away from the hospital, is available for CMH’s use. (Tr., 7/23/09, pgs. 29-32)

This heliport, used by first-responders, is at ground level, on Lake Michigan’s lakefront. Use of this heliport would not require pilots to make a pinnacle landing.

(SOAR Ex. 17, para. 26). Additionally, emergency landings at this facility would pose significantly less risk for collateral damage to people and property. *Id.* Furthermore, a world-renowned expert in Helicopter Emergency Medical Services (HEMS) and emergency medicine, Dr. Bledsoe testified that the patient outcomes should not be impacted and patient safety from helicopter accidents must be considered.

CMH had one of its own physicians review the 78 transports that occurred from August 2006 to August 2007 to CMH's Lincoln park facility and testified that the impact of the extra-time and extra transfer to an ambulance that would be needed if an off-site heliport was used, would result in "significant to severe risk" to the patient medical outcomes.

Section 14.810 of the Aviation Safety Rules requires IDOT to consider: 1) the heliport's proposed location; 2) the heliport's size and layout; 3) the relationship of the proposed heliport to the then current State and Federal Airport and Airways System; 4) whether there are safe areas available for expansion purposes; 5) whether the adjoining areas are free from obstructions based on a proper glide ratio; 6) the nature of the terrain; 7) the nature of the uses to which the proposed heliport will be put; 8) the possibilities for future development; and 9) the minimum standards contained in Subpart H. IDOT is not authorized under this section, nor does it have the expertise or personnel, to consider or evaluate patient outcomes.

The self-serving nature of the CMH patient outcome study is evident. Furthermore, it is not supported by the testimony of Dr. Bryan Bledsoe that HEMS are dramatically over-used and that per the Emergency Medical Treatment and Active Labor Act, CMH is only supposed transport stabilized patients from other facilities.

Dr. Bledsoe testified that the alternative location is far superior as there are significantly fewer obstructions, less wind turbulence, and fewer distractions for pilots. (SOAR Ex. 11, pg. 12). He explained there is no evidence that an extra transfer of a stabilized patient the short distance to the Dime Pier Heliport would have any impact on outcome and the improved safety to the patient from the alternative location must be considered.

I. Due Process Requires that the Application be Denied

In addition to the substantive issues raised herein, SOAR is compelled to point out that the due process violations committed in this matter require that the application be denied. First, the agency has displayed an unreasonable bias in favor of the applicant and a lack of impartiality throughout the course of this application process. Second, SOAR was not provided the most basic rights of due process including the right to adequate discovery or examine witnesses. Third, the decision-maker (IDOT) has accepted and considered material outside of the record and after the close of the record.

1. Bias of the Decision-maker

Mr. Gary Stevens of IDOT sent a letter to Children's Memorial Hospital on November 16, 2006, before any study had been conducted and before the application had been filed, wherein he opined that "[b]ased on our site visit to the new Northwestern Women's Hospital facility situated to the east of the proposed Children's Hospital site, we feel it is feasible to locate a heliport on the roof of the proposed Children's Hospital." (SOAR Ex. 56). Mr. Stevens further testified at the City of Chicago Plan Commission on behalf of CMH on December 13, 2007, before the August 4, 2008 application was filed. At that time he testified, "we rely on outside experts for these sort of studies since we do not have expertise in-house, and we concur that we feel this can be a safe proposal".

(SOAR ex.33, pg, 92). On March 20, 2007 Mr. Stevens (an IDOT principal and apparent decision-maker) even offered to act as CMH's consultant as to the heliport proposal and attend meetings on their behalf. (SOAR Ex. 79, pg. 3; E-mail from Greg Tornatore to Gary Stevens on 3/20/07). It is unclear if he was to be paid for that service.

On the day the hearing commenced, June 23, 2011 IDOT flew to the heliport and landed and then took photographs of its personnel including Director Shea on the heliport in front of the helicopter. The heliport was not licensed by Chicago nor had IDOT issued a Certificate of Approval for the heliport prior to the landings. This conduct, viewed by many of the public, exemplified the impression that IDOT was biased in favor of the application even before the June 2011 hearing commenced.

Ms. Ellen-Schanzle-Haskins, attorney for IDOT, gave opening remarks at the June 23, 2011 hearing, before having reviewed any of the reports or testimony of Dr. Corke and Dr. Veillette concerning the Horn Report, as follows: "I'm very disappointed in [SOAR's attorney] Mr. Porter's opening statement wherein he, a lawyer and not an expert, is attacking the experts that IDOT hired independently to try to help us with this decision. We are very satisfied with the report that they gave us, and I believe that they will be here to present to you just after I finish their reports, their findings; and you can determine in your own mind the validity of their report; but we at IDOT are not here tonight to talk about whether they fulfilled the terms of their contract. We believe that they did. ... I believe they have done a very fine job." (Tr. 6/23/11, pgs. 27-28).

If a disinterested observer would conclude that a decision-maker, had in some measure adjudged the facts as well as the law of the case in advance of hearing, then that decision-maker should be disqualified. *E&E Hauling, Inc v. PCB*, 116 Ill.App3d 586,

451 N.E.2d 555, 566 (2d Dist 1983). In this case, the statements in favor of the proposal, the offer to act as CMH's consultant, and the endorsement of the Horn Report before the hearing on it had even commenced, display the obvious bias of the agency and thus IDOT should be disqualified as the decision-maker.

Additionally, as of July 7, 2011 none of the materials SOAR presented and entered into evidence as exhibits on June 24, 2011 were posted on IDOT's website. Materials submitted by CMH and IDOT at the June 2011 hearing were, however, posted. The public was provided access to CMH's and IDOT's materials but denied access to SOAR's during the public comment period following the hearing. (Letter from Mr. Richard Porter to Ms. Ellen Schanzle-Haskins on July 7, 2011) The materials were eventually posted, but the delay in access to the public was unfair.

2. Right to Discovery and Cross-Examination was Denied

Administrative hearings are "governed by the fundamental principles and requirements of due process of law." *Abrahamson v. Ill. Dep't of Professional Regulation*, 153 Ill.2d 76, 92 (1992). As part of due process, "[p]arties and administration proceedings should use pre-hearing discovery as parties in trials use pretrial discovery, that is, to aid in preparing a case and eliminating surprise so that the outcome can rest on truth rather than on the maneuvers of counsel. The need for discovery at the administrative level is the same." *Smith v. Dep't of Registration and Educ. of the State of Ill.*, 170 Ill.App.3d 40 (1st Dist. 1988), citing *Wegmann v. Dep't of Registration and Educ.*, 61 Ill.App.3d 352 (1st Dist. 1978).

In this case, SOAR requested the opportunity to depose Dr. Horn and Dr. Keller regarding the Horn report. (SOAR Ex. 123). This request was denied by Judge Neville

and IDOT. Holding a hearing without providing SOAR with an opportunity “to prepar[e] a case and eliminat[e] surprise so that the outcome can rest on truth rather than on the maneuvers of counsel” violated SOAR’s right to due process before the administrative body. *Smith*, 170 Ill.App.3d at 45.

“A fair hearing before an administrative agency includes the opportunity to be heard, the right to cross-examine adverse witnesses, and impartiality in ruling upon the evidence.” *Williams v. Bd. of Trust. of Morton Grove Firefighters' Pension Fund*, 398 Ill.App.3d 680, 692 (1st Dist. 2010), citing *Abrahamson*, 153 Ill .2d at 92. Accordingly, “[a]ll parties [must] have an opportunity to cross-examine witnesses and to offer evidence in rebuttal.” *Seul’s, Inc. v. Liquor Control Comm’n*, 240 Ill.App.3d 828 (1st Dist. 1992).

Not only were the depositions of Dr. Horn and Dr. Keller disallowed, but at the June 2009 and July 2011 hearings SOAR was not allowed to question any adverse witnesses. At both hearings the Judge offered to read questions to the witnesses posed by the parties, however at 2009 little to none of the proffered questions of SOAR were posed to any witnesses and at the 2011 hearing only non-leading direct questions were entertained by Judge Neville and only a few of those were posed. Clearly the “right to cross-examine adverse witnesses” was not honored at this administrative hearing. *Williams*, 398 Ill. App. 3d at 692.

3. IDOT Admitted Material After the Close of Evidence and Outside of the Record

At the conclusion of the 2009 public hearing Judge Neville closed the record with these words: “We will officially say that this public hearing is closed. IDOT has received the information that was presented. The court reporter has the exhibits. We will put that together in a binder. It will be a public record.” (Tr., 7/25/09, pgs. 106-107).

Furthermore, he stated that the hearing was, “organized because everyone was interested in having a full hearing with everything admitted.” (Tr. 7/25/09, pg. 106).

Section 14.115(h) of the Aviation Safety Rules provides that “after the hearing has been held, the Division will issue a supplemental order indicating the findings and conclusions of the hearing and whether the original order will stand or whether it will be modified”. 92 Ill.Admin. Code CH. I §14.115(b) 2011. However, IDOT did not issue a Supplemental Order.

Instead, IDOT permitted CMH to supplement its application outside of the public record and commissioned a new study from Continuum Dynamics, Inc. and Dr. Horn, contrary to the Aviation Safety Rules and the Illinois Aeronautics Act. Illinois Aeronautics Act 620 ILCS 5/60. (SOAR Exs. 61 and 69).

The consideration of evidence by a public agency outside of and after the close of a public hearing is fundamentally unfair and a violation of due process. 735 ILCS 5/3-101 et seq.; *County of Kankakee v. Illinois Pollution Control Board*, 2009 WL 4723290 (Ill. App. 3 Dist., 2009). The public participates in the process, expects the opportunity to examine witnesses and the evidence, and expects the reviewing body to base its decision on the materials in the record. See, *E & E Hauling, Inc. v. Illinois Pollution Control Board*, 451 N.E. 2d. 555 (Ill. App. 2nd Dist. 1983).

For these reasons, the acceptance of new material, documents and evidence that is presented outside of the record and following the close of the record on July 25, 2009 was improper. Likewise, the hearing scheduled on June 23 and 24, 2011 was an equally improper consideration of material, testimony and evidence submitted after the close of the record on July 25, 2009. This acceptance of material outside of the record included

testimony concerning flight tests which occurred both the day before and the day on which the 2011 hearing commenced and allowed testimony of IDOT witnesses who had not been identified before the hearing as testifying. This "trial by ambush" was unnecessary and fundamentally unfair. These due process violations warrant denial of the application.

V. CONCLUSION

WHEREFORE, for the above stated reasons, SOAR respectfully requests that IDOT deny the application for the Proposed Heliport.

Dated: July 14, 2011

Respectfully submitted,

Streeterville Organization of Active
Residents

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AFFIDAVIT OF SERVICE

The undersigned, pursuant to the provisions of Section 1-109 of the Illinois Code of Civil Procedure, hereby under penalty of perjury under the laws of the United States of America, certifies that on July 14, 2011, a copy of the foregoing **BRIEF TO DENY THE CHILDREN'S MEMORIAL HOSPITAL APPLICATION FOR CERTIFICATE OF APPROVAL FOR HELIPORT** was served upon:

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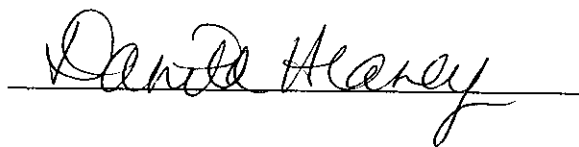
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via e-mail as listed above and by depositing a copy thereof, enclosed in an envelope, in the UPS Overnight Mail at 100 Park Avenue, Rockford, Illinois, proper postage prepaid, at or about the hour of 5:00 o'clock p.m., addressed as above.



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