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THE ENVIRONMENTAL
LAW GROUP

February 3, 2015

Airspace & Rules Manager
Airspace Regulations & ATC Procedures Group
Federal Aviation Administration
800 Independence Ave., SW, Room 425
Washington D.C. 20591

Re: Petition for Reconsideration of "Determination of No Hazard to Air Navigation"
With regard to: **2013-AWP-5595-OE**
2013-AWP-5596-OE
2013-AWP-5597-OE
2013-AWP-5598-OE

To Whom It May Concern:

On January 9, 2015, the FAA issued its conclusion to four aeronautical studies in which it evaluated the proposed construction of four light poles, designed to support lighting for an outdoor football stadium at Point Loma High School in San Diego, California. It concluded the poles would not be a hazard to air traffic if their height was limited to 72' above ground surface, which, at that point, is on top of a hill in line with the approach path to the San Diego International Airport (SDIA).

This conclusion was reached despite the objection of the SDIA to the construction of the poles without first requiring a lighting study to evaluate their impacts. SDIA also registered a general objection to any new construction of any obstacles at a height greater than 60' above ground level, given that existing nonconforming structures already penetrate into the Part 77 34:1 surfaces. At 72' elevation, these poles will be the highest points on top of a high hill and will penetrate into the airspace more deeply than ever before.

The study reached its conclusion while acknowledging that the "FAA cannot protect for every possible emergency contingency…[and some] are beyond the scope of an aeronautical study" ("Basis for Decision", p 7) and further conceding that "Light spillage is likely to produce glare which will be visible to pilots…." Nonetheless, the FAA was content to simply ask the project proponent to provide some sort of undefined "shielding" of an unspecified nature prior to determining the lights are no hazard. ("Conditions", p 8).

The reviewer completely ignored the SDIA's request for a lighting study and relied solely on a geometrical analysis of the height of the poles and the degree to which they intrude into a Part 77 34:1 surface to conclude that they present "no hazard" to avigation. Even under that limited geometrical analysis, adherence to the requirements was applied very liberally to allow further nonconforming structures at *a height greater than any other now in the approach path*, despite the objections of the airport. This should be unacceptable, particularly at this location.

The SDIA is one of only a handful of "special qualifications" airports as provided by FAR 121.445. The general flying public is well aware of the fact that the airport presents challenges, particularly when inclement weather conditions (found regularly along the coast) require landing almost directly over the High School (and the adjacent Elementary School). We are informed by Dean Robbins, of SDIA operations, that allowing these nonconforming structures will force a reevaluation of the approach slope to 3.1, pushing the point of displacement farther down the runway and shortening its effective useful length, creating increased difficulties for pilots. Although one cannot argue that the FAA "cannot protect for *any possible* contingency", one expects that the FAA would act cautiously in light of known hazards, at an airport that sits crowded in the midst of a heavily populated urban environment, with schools in the line of its ILS approach.

Finding that there is "no hazard", without requiring the lighting study requested by the SDIA - and the potentially detailed measures that might be required to fully protect pilots from distractions and the public from disaster (assuming that mitigation is even possible) - is reckless. Allowing a further and deeper penetration by these light poles into the Part 77 34:1 surfaces than any other existing structures and shortening the runway's effective length is unwarranted. These are sanguine allowances for a high school football stadium, where young people will congregate nearby in dense numbers, in the fall, in the evening, when weather is often impacted by a low lying marine layer. We believe that, on the contrary, this situation should require the most scrupulous attention to safety. We are not raising the specter of "any possible contingency" – we are observing the presence of known threats. This Determination should be revisited and reconsidered with fresh and prudent eyes.

In the interest of illustrating the science that should be brought to bear in the lighting study that the SDIA requested, we have taken the liberty of requesting a distinguished expert in glare and lighting impacts to outline issues that such a lighting study must address. This is new information not previously considered by the FAA. Dr. Wayne Wilson has provided us with a report, which is attached, that points the FAA to the issues they should require the San Diego Unified School District to study and evaluate (for FAA review) prior to any determination that the bright football lighting presents "no hazards". This study describes the complex phenomena that occur as a result of the combination of bright lighting, raised above other structures, in marine weather conditions in southern California. The impacts of glare – direct lighting in the pilot's line of sight – and the impacts of potential improper use of laser pointing devices (given the low altitude of aircraft at that point) are not evaluated in Dr. Wilson's report, but also provide bases for safety concerns. The impacts from glare, in particular, should be evaluated not solely under inclement weather conditions, but in clear conditions when pilots using runway 27 for take-off may find themselves looking straight into these new lights.

In addition, there has been no effort to explore whether these new light sources (they are being placed on a field which has not previously had night lighting) can pose a threat to air traffic because of their placement in a region well known for the abundance of its marine and riparian wildlife, particularly birds. While some of the local species are endangered, such as the Ridgeway Rail, low flying aircraft can encounter a wide variety of species. There has been no evaluation of the likelihood that the new source of intense illumination may attract denser insect activity, which may in turn attract more birds to the airspace. Without study and evaluation, it is another unresolved threat.

There may be additional factors that have not been considered in the FAA's preliminary determination of "no hazard". I represent "Pro Point Loma", a group of over 800 concerned local citizens all aghast that the FAA is prepared to allow this process to proceed with no consideration of these issues. Members of Pro Point Loma submitted written comments and have appeared at public meetings held at the SDIA to object to the safety issues these poles create. Members of Pro Point Loma asked for information from the FAA under the Freedom of Information Act months previously, but still have not received the documentation requested. Once the information is finally distributed to our members, we may find other issues that we would raise to supplement this Petition for Reconsideration. Without the FAA having yet provided the information, we have no way of evaluating that possibility, and so we respectfully reserve our right to amend and supplement this Petition once that documentation has been received and reviewed.

There is no justification for a rush to judgment in this instance. Thousands of people live in the flight path over which hundreds of aircraft pass daily. This situation demands care, prudence, and application of the strictest standards to try to reach a "zero tolerance" level for safety. The flying public, and the people they pass over, deserve no less. Require a lighting study that is complete and comprehensive.

Sincerely,

OPPER & VARCO LLP

Richard G. Opper

/rgo

Attachments:

Report on Ground Illumination Sources, Wayne Wilson, Ph.D
Objections to Lights from the SDIA, Letter of March 3, 2014

cc: Lynn Roxas (SDSU)
Cindy Marten (SDSU)
Robert Gleason, SDIA Board Chair
Brett Lobner , SDIA General Counsel
Thella Bowen, SDIA Administrator
Rep. Scott Peters (Member of Congress)

ATTACHMENT 1

Impact of Ground Illumination Sources and Marine Layer on Approach to San Diego International Airport (SAN) Runway 9

Wayne H. Wilson, PhD (see Appendix I)

Summary

The question has arisen about whether there needs to be a Lighting Study for the proposed installation of stadium lighting in airspace near the San Diego International Airport. A review of the impact on the surrounding community of the installation and use of lights at the football/soccer/track stadium at the Point Loma High School (PLHS), located at 2335 Chatsworth Boulevard, San Diego, CA 92106, indicated there might be a problem with respect to Instrument Landing System (ILS) landing approaches to the San Diego International Airport (SAN). The issue is the potential impact of ground lights in general on the approach to Runway 09 at SAN during periods when a low ceiling marine layer or fog layer at the airport is present. A review of this topic found no current or historical assessment of the impact of such low ceiling on SAN airport landing operations. This paper is a summary of concerns raised during the review with specific suggestions for further assessment, study of the issue and evaluation of any safety requirements raised by the potential installation of stadium lighting at this location.

Background

A primary issue for any impact study on stadium lighting at Pt Loma HS and the proximity of SAN is the common occurrence of low ceiling cloud/fog marine layers in the region, which must be further studied and addressed. These low ceilings are quite common during the late afternoon/evening hours in the winter/spring months when the stadium is used most often. Any lighting study performed during periods of clear skies/high ceilings will not adequately account for the effect during low ceilings. The low ceilings impact airport operations, both departure and landing, and have been taken into account in the FAA regulations for instrument landings at SAN using Runway 09. However, these low ceilings will have a much greater impact in the vicinity of the school site since it is approximately 180-200 feet higher in altitude than the airport and within a half of mile of the approach to the airport's instrument landing system on Runway 09. The low ceiling has an impact on the light pollution to the surrounding neighborhood by dissipation of light from potential stadium lights by acting as a diffuse reflector of light that will increase the levels of light to the surrounding neighborhood. The low ceiling also increases the impact of the lights on aircraft flying above the cloud layer, usually 200 to 1000 feet thick. Anyone who has flown into Lindberg Field during low ceiling conditions can see that the low clouds confuses the location of ground buildings, neighborhoods, etc. and can be a potential distraction to pilots. These lights may be significant in the controlled San Diego Air Traffic Controlled Space but this has not been specifically studied and needs to be addressed, modeled and researched for its impact on air traffic, including helicopters, in the vicinity of Lindberg Field.

This paper is not an environmental impact report. No effort has been made to perform any analysis other than to assess general issues. The review is only to assess what areas need to be addressed, studied and analyzed in order to assess safety concerns in the context of aircraft operations during approach to SAN during period of low cloud ceilings due to the presence of a marine layer.

Situation

The situation with respect to the impact of low ceilings on approaches to SAN can be broken down into four (4) components:

1) FAA regulations concerning operations during instrument approaches to SAN and the required plans and aircraft operations during such periods.

2) Low ceiling or marine layer effects in the area surrounding SAN and the Point Loma (i.e. Loma Portal) area.

3) Ground sources illumination and effects on visibility in the airspace above the situation area

4) Pilot distractions during instrument landing approaches over the Point Loma area during school events in which stadium lighting is in use.

There is a significant point in addressing the current outlined situation. An assessment of the situation must address each component and their interaction with each other. One must understand the overall impact that each has on the total probability matrix that is required to be generated and analyzed for instrument approaches to SAN. It is a mistake to concentrate on any one component since the total impact of all components must be integrated and gauged and the relationships between and among the components understood and treated as a whole rather than separately. Currently it appears that only the geometry of airspace intrusion by a physical object has been evaluated, and the impacts of the lighting itself have not been assessed.

Four components:

1) FAA regulations concerning operations during instrument approaches to SAN.

The San Diego International Airport is operated as a controlled airspace by the FAA. During periods of reduced visibility at the airport only instrument approaches to SAN using ILS to Runway 09 can be conducted. Under the FAA regulations for general planning and conduct, Instrument approaches by pilots is defined under Title 14 of the Code of Federal Regulations (14 CFR) Part 93, 121, 125, and 135. The information for such approaches is condensed in the instrument approach plates (IAPS) defined and produced by the FAA and outlined in the Instrument Procedures Handbook (FAA-H-8083-16). The approach surface spaces for SAN are defined in part 77, Subpart C of the above document and are included in the SAN Airport Land Use Compatibility Plan (http://www.san.org/Airport-Projects/Land-Use-Compatibility - SAN_AirportLandUseCompatibilityPlan-2014.pdf).

An important factor to note with respect to approach operations at SAN is that the FAA has designated the airport as a Special Qualification Airport. Per 14 CFR-121.445, "... The Administrator may determine that certain airports (due to items such as surrounding terrain, obstructions, or complex approach or departure procedures) are special airports requiring special airport qualifications and that certain areas or routes, or both, require a special type of navigation qualification." This means that there are additional requirements for pilot training, airport and approach operations beyond the normal requirements. Overall this is an indication that approach operations to SAN are not standard procedures compared to the average airport.

As an example, the specific approach plan (or Plate as it is referred to) for SAN during instrument landing is provided in Appendix III. These plates provide the pilot in a condensed format on one page the requirements for the approach and landing. A very specific part of the plate sets out the requirement for the pilot to declare a "missed approach" spelling out the minimum altitude and visibility that is required to be followed.

An example of the extraction of the ILS plate (Appendix III) is provided here,

CATEGORY	A	B	C	D
S-ILS 9	353/50 336 (400-1)			
S-LOC 9	540/50 526 (600-1)		540-1½ 526 (600-1½)	540-1¾ 526 (600-1¾)
CIRCLING	820-1 803 (900-1)	820-1¼ 803 (900-1¼)	820-2¼ 803 (900-2¼)	820-2½ 803 (900-2½)

Figure 1 – Extracted ILS Approach Missed Approach Requirement

Without going into much detail here (the interested reader is referred to the FAA document "Insrument Procedures Handbook" FAA-H-8083-16), the interesting set of numbers are on the line S-ILS 9, "353/50". This set of number indicates is that if the aircraft, using the category S-ILS 9, reaches an altitude of 353 feet and the runway environment is not visible the pilot must declare a missed approach and abort the approach. The other numbers in the table are for other conditions. It should be noted that the numbers in parentheses realte to military military operators, and mention that SAN often serves as a divert airport for military pilots who may not be familiar with the unique challenges, and have different requirements and limitations than airline operators.

This altiude may be in or very close to the lower ceiling of a marine layer (which may be in the region of 400 feet, see below in Fig.2) present in the area. Given that the maximum altiude in this area of Point Loma is of the order of 160 feet with structures of 20-30 feet on top there may be little margin of error. Any pilot distraction occuring during this period may hinder the operation of the aircraft.

The location of Point Loma High School with respect to SAN is shown in Figure 2 (a snapshot from Google Earth) with the SAN approach path to Runway 09 outlined.

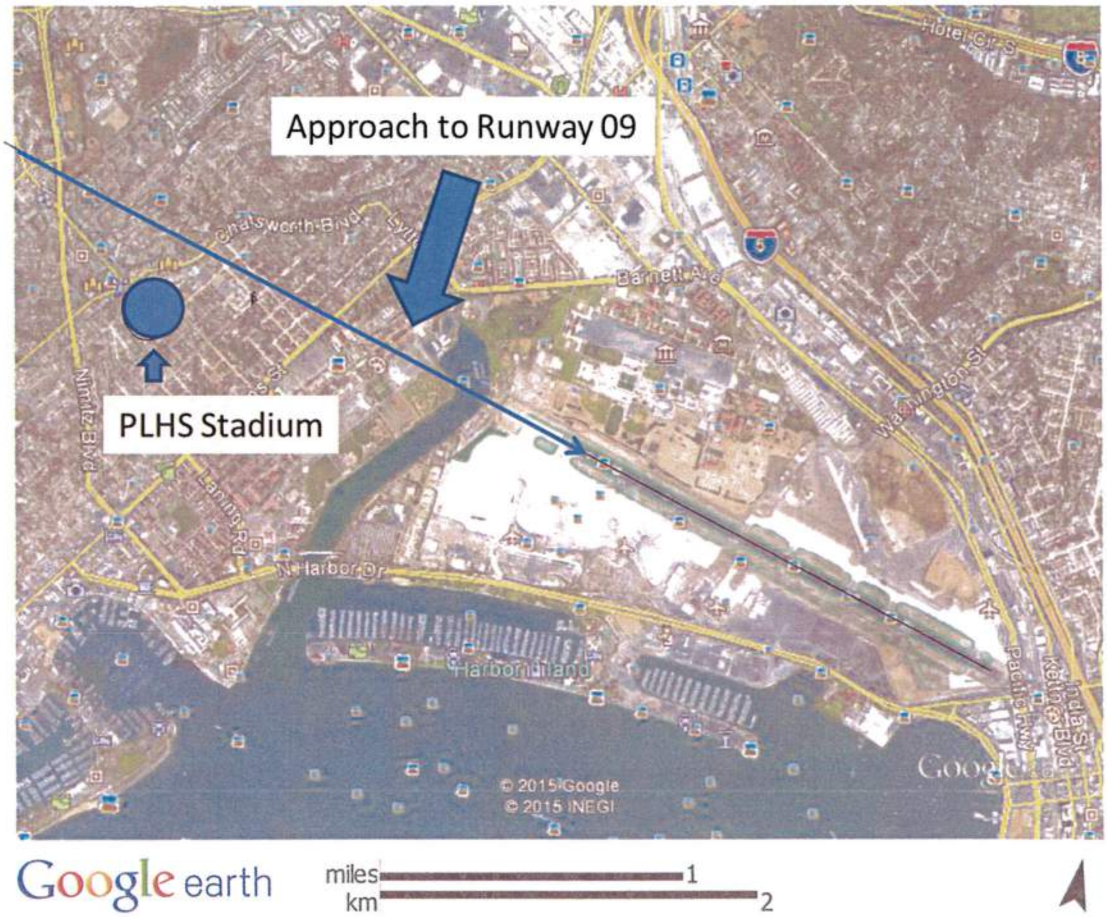


Figure 2 – Satellite Image with SAN, approach and Point Loma High School

In Appendix E "Technical Analysis E4: Airspace Protection Factor Technical Analysis" of the Land Compatibility report (see SAN_AirportLandUseCompatibilityPlan-2014.pdf http://www.san.org/Airport-Projects/Land-Use-Compatibility) defines the airspace of SAN using the FAA obstruction standards of the FAA Title 14 Part 77, subpart C document. The particular figure of interest from this plan is Exhibit E4-6 on page E-91, see Appendix II. The plot is repeated here in figure 3.

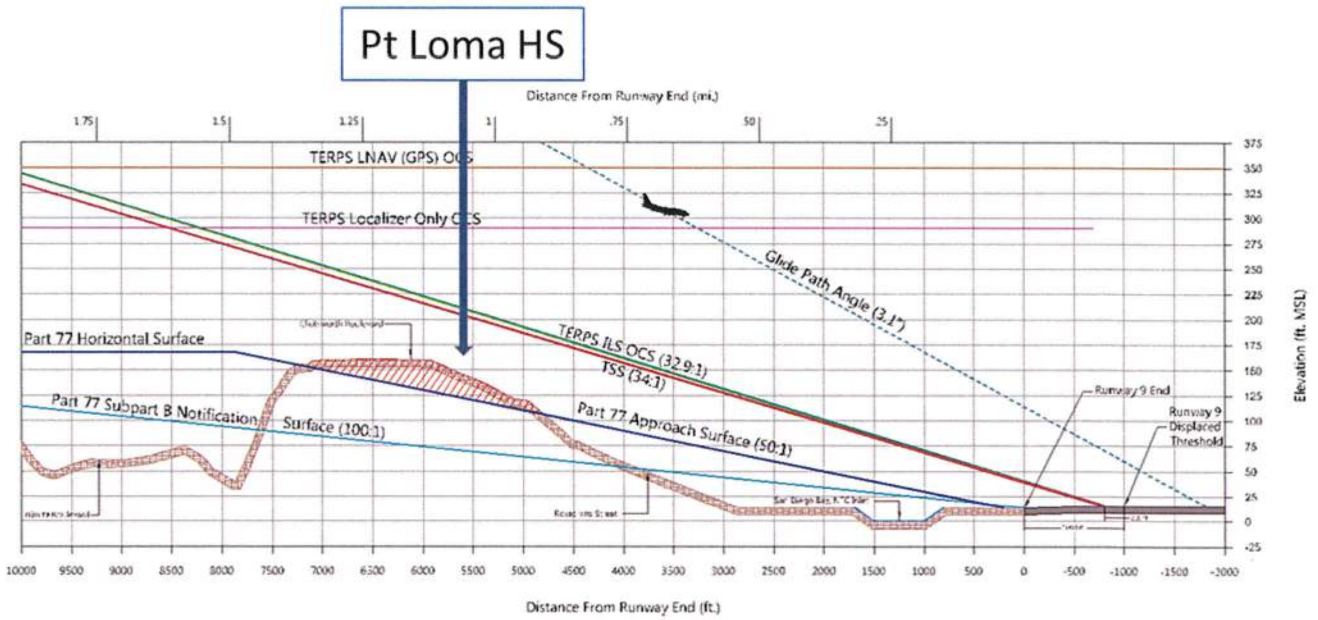


Figure 3 – Runway 09 Airspace Surfaces Profile
SAN_AirportLandUseCompatibilityPlan-2014.pdf
Appendix E4
(http://www.san.org/Airport-Projects/Land-Use-Compatibility)

The location of Point Loma High School is flagged in Figure 3 but is still above the Part 77 Approach Surface and therefore any development at the site must be assessed for impact on aircraft operations at SAN. An initial assessment was made and the results place restrictions on the height of stadium lights installed at the stadium at the high school. The initial assessment of the airspace geometries have resulted in an upper height restriction of the light standards at the high school stadium to be less than 60-72 feet.

The initial assessment did not address potential impact of the lighting itself on any approach requirements.

2) Low ceiling or marine layers effects in the area surrounding SAN and the Point Loma area.

The low ceilings discussed above are a well known and researched environmental effect that is common in the entire Southern California coastal region. A satellite image of a typical marine layer is show in Figure 4.

Figure 4 – Southern California Marine Layer Satellite Image

San Diego Marine Layer

A very good and thorough review and description of the San Diego marine layer is on the UCSD SIO web site at http://meteora.ucsd.edu/~iacob/marinelayer.html Also see http://www.srh.noaa.gov/jetstream/ocean/marine.htm

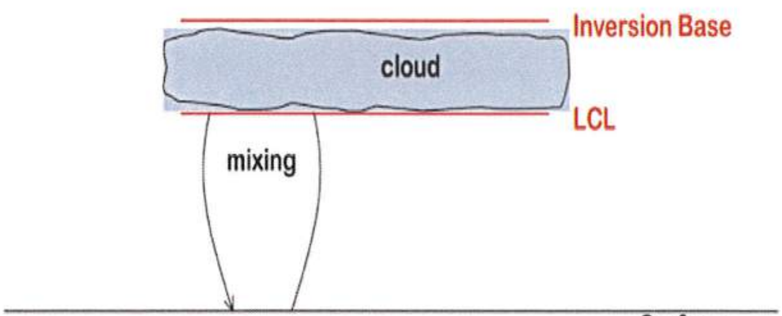


Figure 5 – Marine Layer Formation
(http://meteora.ucsd.edu/~iacob/ml_formation.html)

The following is an extraction and summary from those pages.

"Marine Layer clouds that impact California are low altitude stratus clouds that form over the adjacent ocean waters. Once formed, they may be advected by the wind over land areas. Stratus type clouds are sheet like clouds with close to horizontally uniform base and top. They generally extend for large distances horizontally (10-100s of kms), but are relatively shallow in depth usually (usually 500-2000 meters)."

"The formation of these clouds usually begins when wind over the water surface mixes moist surface air upwards. As this air moves up, it expands and cools. The cooling causes the relative humidity to increase and once the relative humidity reaches 100%, condensation of water vapor into liquid water drops takes place and clouds begin form. The depth through which the air mixes is referred to as the mixed layer."

"Usually, temperature decreases as one moves upward in the atmosphere. However, in an inversion layer the temperature increases with height and forms a very stable layer that acts as lid keeping the air beneath from penetrating higher into the atmosphere. … As seen in the figure above, the inversion base limits the vertical extent of air mixing near the surface. This type of inversion is often called a subsidence inversion or a marine air inversion."

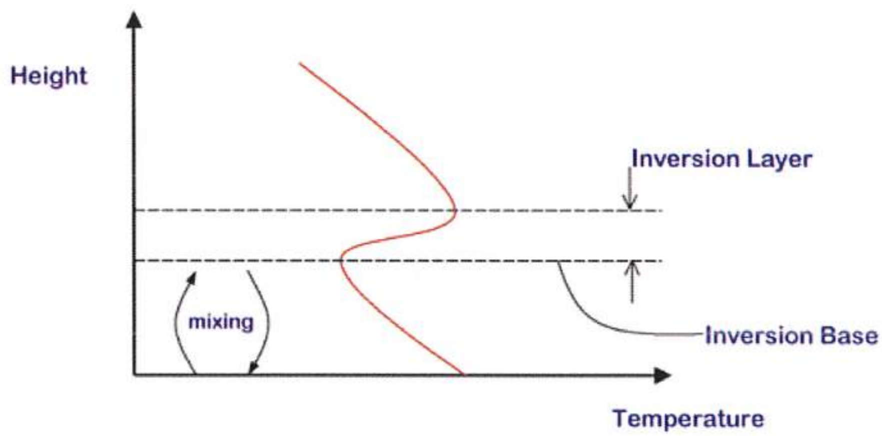


Figure 6 – Inversion Layer Formation
(http://meteora.ucsd.edu/~iacob/ml_formation.html)

"The depth of the marine layer depends upon the large scale weather patterns that pass overhead. High pressure systems (at 15,000 to 30,000 feet) tend to squish the marine layer down near the surface. When the inversion is very strong and relatively shallow, the coastal clouds and foggy weather will be confined to the beaches with warm, sunny conditions beginning just a mile or so inland. "

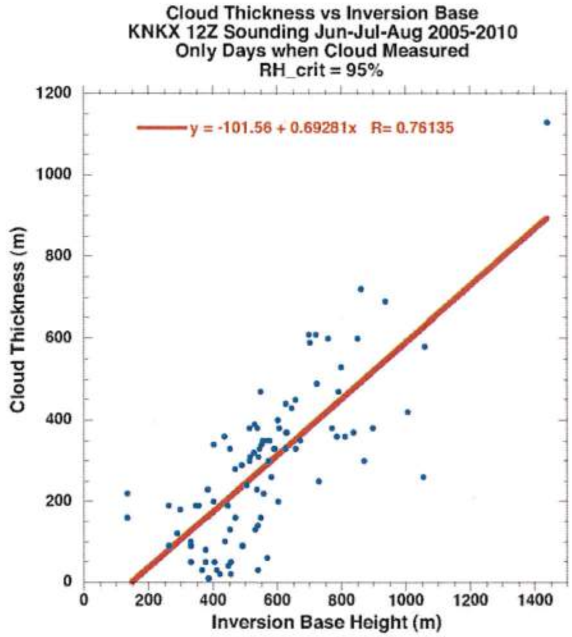


Figure 7 – Marine Layer Thickness versus Inversion Base
(http://meteora.ucsd.edu/~iacob/ml_duration.html)

An interesting feature of a marine layer is illustrated in Figure 6 showing that the layer usually has an approximately defined thickness. A study by UCSD on marine layers based on meteorological observations at SAN weathers station (e.g., KSAN) as well as the weather and high altitude observations made at the Rawinsonde station (KNKX) in Kearny Mesa (approximately 8.8 km northwest of SAN) show the relationship between the lower ceiling level and the layer thickness.

UCSD has analyzed the meteorological historical databases from KSAN and KNKX and plotted the occurrences, lower altitude and the thickness of the layer for the coastal marine region. Several of these summary charts are displayed below in Figures 8 and 9. UCSD researchers have primarily focused on the morning hours during the summer when San Diego in general experiences the "May Gray, June Gloom" that affects the beach crowd attendance. The data is available, however, to focus more on the marine layers historical database and the probability that the marine layer would impact the Pt Loma approach path. This analysis is required before any further assessment of the impact of the low ceiling/fog marine layer has on approach operations at SAN.

The FAA may already have studied this issue but a web search has not yielded any report or summary of such a study.

The issue for the current situation is that the lower ceiling cutoff for instrument approaches to SAN is of the order of 200-300 feet depending on the horizontal visibility at SAN. With the altitude of the Pt Loma HS Stadium of about 180 feet with a projected stadium light height of another 60-72 feet these low marine layer occurrences could put the lights in the lower regions of the clouds even though the airport was still permitting ILS landing approaches.

Whether the lights are in fact going to be in the marine layer or not, the low cloud will be illuminated below by reflection from the stadium lights from the grass field and surrounding area of the stadium.

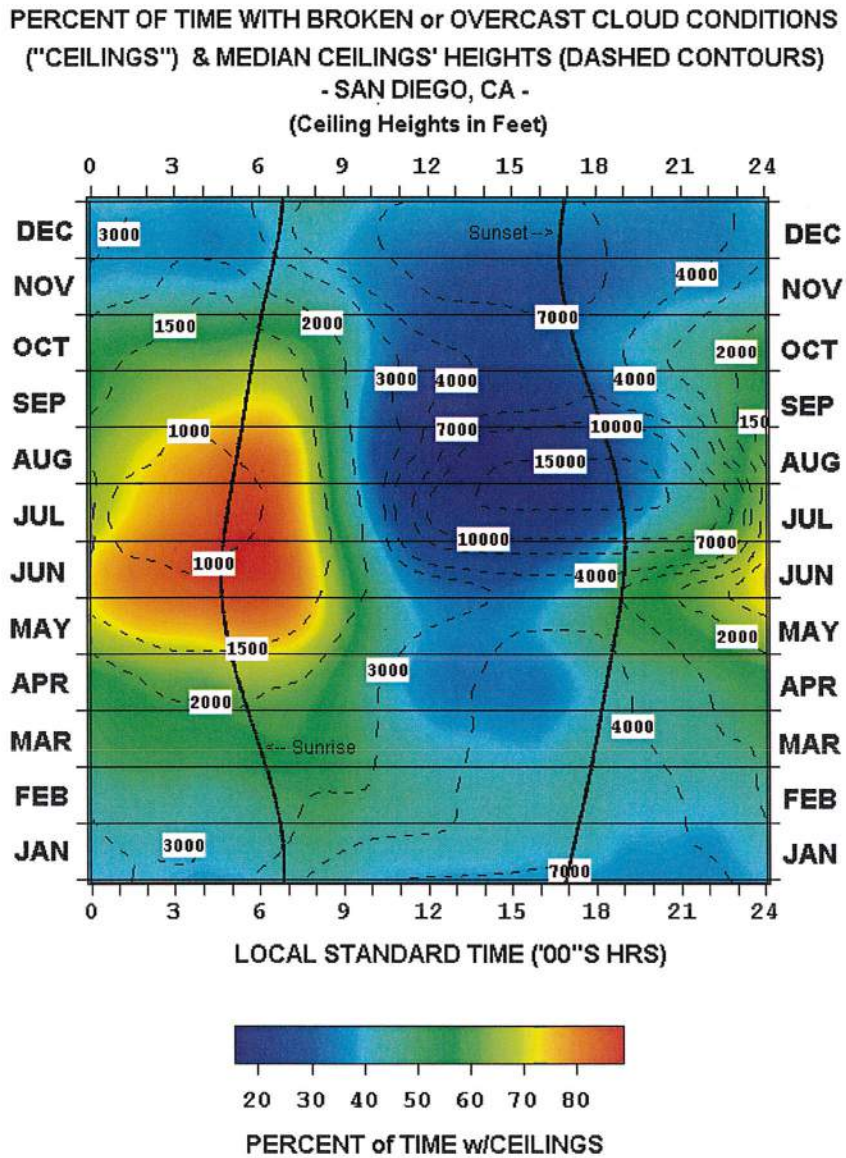


Figure 8 – Cloud Conditions at San Diego
(http://www.climatestations.com/images/stories/san-diego/sdclngs.gif)

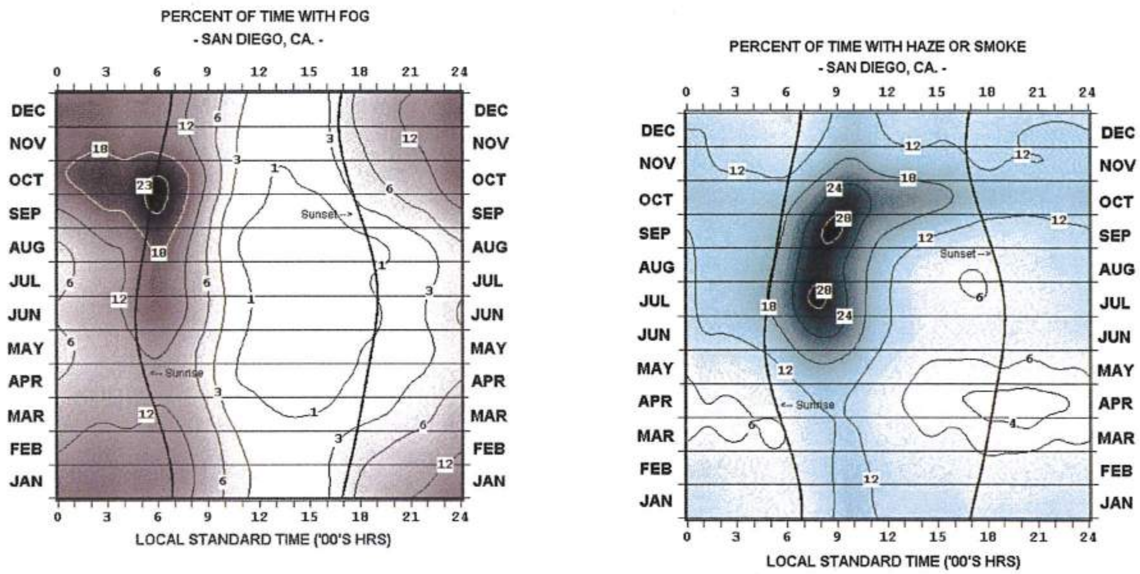


Figure 9 – Fog Conditions
(http://www.climatestations.com/images/stories/san-diego/sdfghz.gif)

3) Ground sources illumination and effects on visibility in the airspace above the situation area

One can't assume that the issue of illumination of clouds by stadium lights will generate a glare or direct reflection of light in the direction of the aircraft during approaches. This is not the case.

This paper has focused on the impact of lighting on particular atmospheric conditions and the potential effects of direct glare or other lighting phenomena (such as directed laser devices) is not addressed herein.

The issue is that the low ceiling clouds will be illuminated from below and the visual effect to a pilot approaching them appears as a large diffuse illumination source. The size may be 2 to 3 times the size of the stadium lighting configuration itself (on the order of 150 by 100 yards) and may be broken up by voids or sublayers in the clouds, but there will be no direct glare. An example of the diffuse lighting from low clouds can be seen in the photograph taken over Chicago in Figure 10.

There are a large number of studies describing the effect of ground sources on illumination of surrounding regions and also illumination of clouds above the ground. Several more recent and informative studies are:

"Modeling light Pollution in Suburbs Using Remote Sensing and GIS", Tavoosi, H, et.al., The seventh International conference on Urban Climate (2009).

This paper addresses the more widely interest in light pollution around urban regions but discusses the algorithms and techniques for modeling the effect of ground illumination sources.

"Real-time realistic illumination and shading of stratiform clouds", Bouthes,A, et. al., Eurographics Workshops on Natural Phenomena (2006).

This paper, while discussing higher altitude clouds, does present a good description of the techniques and algorithms necessary for modeling the illumination of clouds in general. It shows how to use the current graphics capabilities of recent computers to accelerate the modeling process.

"Lighting and Astronomy", Luginbuhl, A, et. al., Physics Today (December 2009).

Discusses light pollution with respect to astronomical issues but also a good discussion of light modeling from ground illumination sources through the atmosphere, including clouds.

"Measuring Intensity of Laser Light Penetrating Flight Decks in Laser Illumination", DeMik, R, et. al., Journal of Aviation Technology and Engineering (2013).

While this paper addresses the issue of laser illumination affecting pilots it has a very good discussion of light propagation through the atmosphere and cloud decks.

Figure 10 – Aerial Photography over Chicago during low cloud layers

The modeling for stadium lighting scenarios and light diffusion through low ceiling clouds is straightforward and can be performed by a number of techniques. There is a group at SDSU that has performed some of these modeling efforts.

The Current Environment Impact Report drafts (C-EIR) by the San Diego Unified School District (SDUSD) on other stadiums being proposed for San Diego County describe some of the current modeling of stadium lighting. A couple of these are:

"Crawford High School and Mann Middle School Athletic Facility Upgrade and Modernization Project", Crawford_Mann_Recirc_Draft_EIR_Dec_2014.pdf, SDUSD (2014)

and

"Correia Middle School Sports Complex Project SCH #2013051030" Correia_SportsComplex_DraftEIR_Dec2014.pdf, SDUSD (2014)

Both of these studies used the sports lighting firm Musco Lighting (http://www.musco.com/) for the analysis modeling of the lighting from their suggested field lighting configurations. This modeling computed the expected lighting on the field and adjacent areas and also any glow towards the sky from the lights themselves. The modeling did not include any reflectance from the field and/or adjacent areas back into the sky. The typical reflectance from grass or artificial grass is roughly 10% in the visible region. Concrete or wood from adjacent areas may have higher reflectance producing more light being reflected into the sky, and in the current situation, into low clouds.

While the modeling of the diffuse lighting of the low clouds generated by the reflection of the stadium lights was not performed it can be done using existing illumination methodologies and algorithms.

4) Pilot distractions during instrument landing approaches

During instrument approaches to SAN during periods of low ceiling (remember that this is the primary reason for landing on Runway 09) the FAA has spelled out aircraft location, direction, speed, glide slope, etc. It has specified the minimum altitude and distance to Runway 09 that a pilot's decision to announce a missed approach must be made (see Component 1 discussions above).

Even under instrument conditions (i.e., so called ILS) where a computer is flying the aircraft, the pilot must make a conscious decision for a missed approach if he can't see the runway. This may be at a very low altitude, i.e., 353 feet for a S-ILS-9 approach to Runway 09.

Under low ceiling conditions the base of the marine layer or fog may be in the range of 200-500 feet with a layer thickness of 200-600 feet (see Figure 7). It means that as the plane passes over the Ocean Beach shoreline on Point Loma on the approach to Runway 09 it may be above the marine layer and can't yet clearly see the airport. The pilot's view is a cloud deck with ground lights seen as diffuse blobs of light ahead and beneath the aircraft.

Very close to the line of sight, the proposed stadium lights are a short distance to the right off the first officer's side. The ground distance is roughly 1000 feet or less or 15-20 degrees to the right of the line of sight. The stadiums lights, if on, are brighter than any other lights in view due to the lack of surrounding bright lights. As they are not always on due to the activity schedule at the high school, the pilot may not be familiar with the stadium light situation.

As the aircraft continues the descent into the marine layer the diffuse illuminated cloud becomes more and more diffuse and even portions of the direct ground lights themselves may be viewed through breaks in the cloud as the aircraft approaches the point of missed approach decision.

The FAA has acknowledged that optical illusions and lights during an approach may affect a pilot's perception of his orientation to the surrounding environment and act as a distraction to the approach operations. (https://www.faa.gov/air_traffic/publications/ATpubs/AIM/ (see in particular sections 8.1.5 and 8.1.6), The potential for distraction of the pilots by the stadium lights creating a diffuse sphere of light near the path of the aircraft may also exist. There may be a tendency to misjudge the aircraft altitude, direction of flight and aircraft location and may lead to the pilot's s mistrust of his instruments.

Since the 1980s the FAA has investigated and discussed pilot distractions both in the aircraft and those introduced from the outside. These distractions have led to rules and regulations focused on the reduction and elimination of any type of distraction during aircraft operations, especially during critical flight periods. These distractions include the obvious ones of extra personnel in the cockpit, non-aircraft related conversations and over the years has expanded to include use of non-aircraft related computers, smart phones, taking pictures, etc.

However, further extensions have focused on training flight crews to ignore outside aircraft phenomenon such as activities on the ground or out of the cockpit window that might distract the flight crew. There is a fine balance required here from the perspective of safe operation of an aircraft during critical operations such as approaches. It is the flight deck crew's responsibility to constantly monitor events outside the aircraft and its' relationship with other aircraft in the vicinity, other potential hazards, weather, including clouds, lightning, etc. The presence of fairly large diffuse illuminated cloud deck close to an approach path may be considered a unique event that may contribute to pilot distraction.

A web search has not yielded any reports or documents addressing the probability that the FAA assigns to these external illumination distraction issues but it is felt that they should be addressed, studied and assessed in the context of the current situation.

Conclusion

The situation can be summarized by stating that if any one of the components discussed here is evaluated separately there are no apparent issues associated with the installation of stadium lights at the PLHS.

However it is essential to look at the issue as a whole and integrate all of the components in order to make a true assessment of the situation. A decision can only be made when each component is studied and then incorporated with each of the other three components and looked at as a whole. In the interest of safety to the pilots, the students and the Point Loma community, this situation should be studied and analyzed in more detail rather than making a decision on stadium lighting based solely on airspace geometry.

As was stated, the FAA develops a probability matrix based on each phase of an aircraft operations and has formulated rules and regulations to reduce the probabilities of failures and potential accidents and losses of aircraft and/or life for each phase. Based on this brief review of the situation of the potential impact of the marine layer and ground illumination sources close to the ILS approach path the current situation needs to be addressed and assessed as they have done others. There are not many reports or documents on pilot distraction issues with lighting geometries. Therefore, as discussed briefly above, an estimation of the probabilities of such a scenarios occurring at SAN should be reviewed, addressed and assessed. This has not yet occurred.

Appendix I – Author

Wayne H Wilson, PhD
whw@omega2a.com

University of California, Berkeley, Physics BA – 1965
University of California, San Diego, PhD - 1972

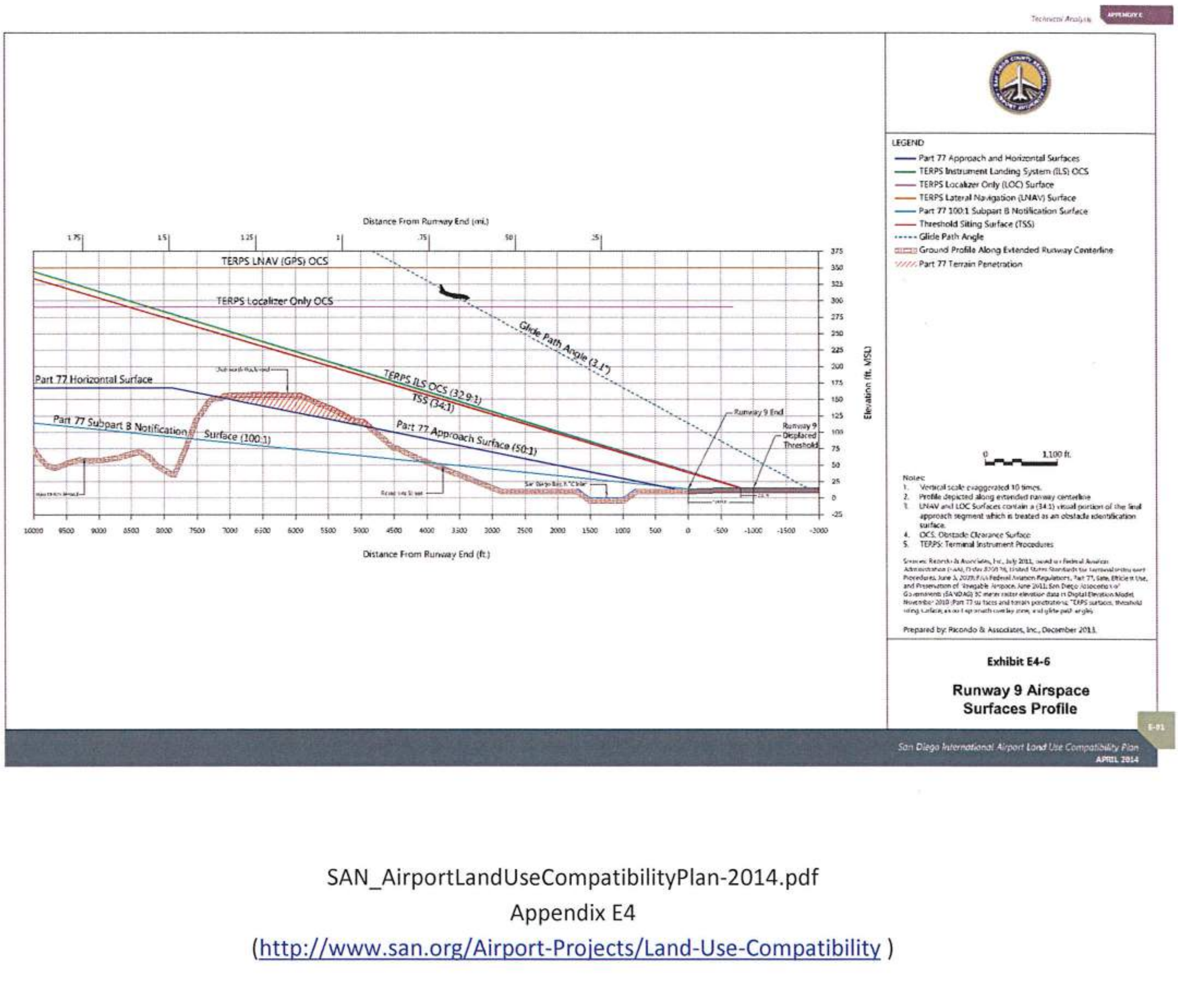
Dr. Wilson worked from 1968-1980 at Visibility Laboratory, Scripps Institute of Oceanography, University of California, San Diego. Assisted in development and coding of first visual analysis simulator in response to the aircraft accident in 1978 over San Diego between a Boeing 727 and a Cessna over San Diego Airport.

From 1979 to 2015 Dr. Wilson worked in the NASA/DoD community on Research and Development (R&D) of E/O (e.g. electro-optical) devices and their use in remote sensing systems, including aircraft visual and sensor remote sensing. He was employed at Photon Research Associates (PRA) from 1979 until 2006 as Chief Scientist. After PRA was acquired by Raytheon in 2006, he continued working as a Senior Engineer until his retirement in 2014.

Dr. Wilson does not have a pilot license and has never had pilot or any type of FAA training.

Dr. Wilson has lived in the Point Loma area under the approach path for over 40 years and has observed hundreds if not thousands of low ceiling approaches and dozens of missed approaches, including 747s and a C5a. Some of these missed approaches occurred directly above his head while in the vicinity of PLHS while the aircraft was an altitude of 300-400 feet with a corresponding low ceiling at the same estimated altitude.

Appendix II – Runway 09 Airspace Surfaces Profile



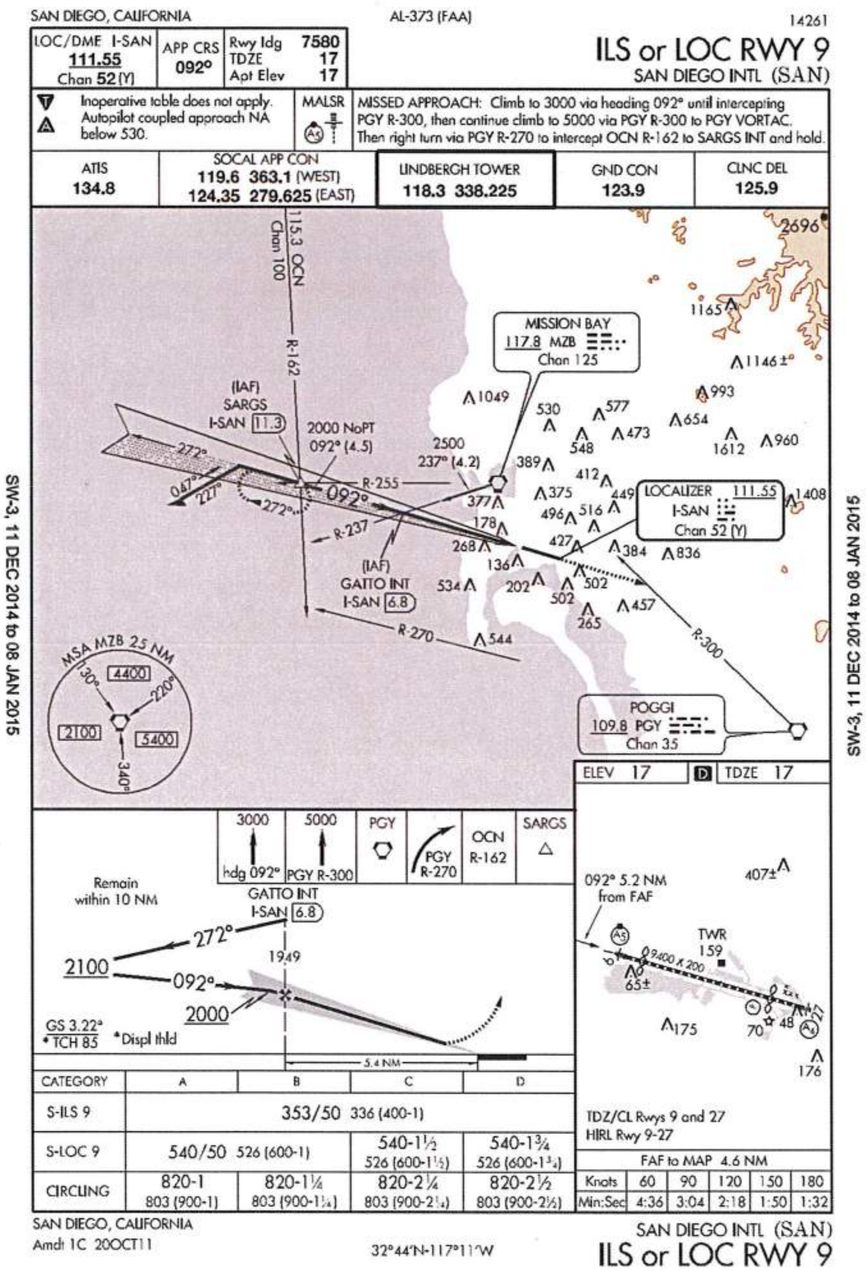
SAN_AirportLandUseCompatibilityPlan-2014.pdf

Appendix E4

(http://www.san.org/Airport-Projects/Land-Use-Compatibility)

Appendix III - Instrument Approach Procedures Plat for SAN Runway 9

The following chart for the current IAPS plate for instrument approaches to SAN



CATEGORY	A	B	C	D
S-ILS 9	353/50 336 (400-1)			
S-LOC 9	540/50 526 (600-1)		540-1½ 526 (600-1½)	540-1¾ 526 (600-1¾)
CIRCLING	820-1 803 (900-1)	820-1¼ 803 (900-1¼)	820-2¼ 803 (900-2¼)	820-2½ 803 (900-2½)

FAF to MAP 4.6 NM					
Knots	60	90	120	150	180
Min:Sec	4:36	3:04	2:18	1:50	1:32

ATTACHMENT 2

SAN DIEGO COUNTY
REGIONAL AIRPORT AUTHORITY

P.O. BOX 82776, SAN DIEGO, CA 92138-2776
619.400.2400 WWW.SAN.ORG

March 3, 2014

Karen L. McDonald
Federal Aviation Administration
Western Pacific Regional Office
PO Box 92007-AWP-520
Los Angeles, CA 90009-2007

RE: Aeronautical Study 2013-AWP-5595-OE
Aeronautical Study 2013-AWP-5596-OE
Aeronautical Study 2013-AWP-5597-OE
Aeronautical Study 2013-AWP-5598-OE

Dear Ms. McDonald:

Thank you for the opportunity to provide comments regarding the aforementioned Aeronautical Studies which propose the installation of light poles at Point Loma High School.

The proposed light poles penetrate the Part 77 34:1 surface for Lindbergh Field in excess of existing manmade obstacles which would in effect create a new hazard to air navigation for the approach to Runway 9 and Departure Surface for Runway 27.

The airport objects to the installation of these light poles at the *proposed elevations of roughly 90-feet AGL*. Further the California Public Utility Code section 21659 provides guidance as to what is and is not permitted with regard to obstacles around airports.

At present, the tallest manmade obstacle for Runway 9 penetrates the current Part 77 34:1 surface by 16.8 feet. This is a building that predates the airport located on Alcott Court in Point Loma. If all of the proposed obstacles were reduced by 30-feet (max height of 60-feet AGL), they would be below the existing controlling manmade obstacle and therefore not introduce a new hazard to air navigation.

We also ask that a lighting study be conducted to ensure the installation does not introduce any issues to flight crew visibility on approach given its proximity to the extended runway centerline and decision point for the approach to Runway 9.

Best Regards,

George B. Condon

George P. Condon
Director
Airside Operations, Aviation Security & Public Safety

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