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OPNAV INSTRUCTION 11010.36C
MARINE CORPS ORDER 11010.16

From: Chief of Naval Operations
Commandant of the Marine Corps

Subj: AIR INSTALLATIONS COMPATIBLE USE ZONES (AICUZ) PROGRAM

Ref: (a) DoD Instruction 4165.57 of 8 Nov 1977
(b) Noise Control Act of 1972, 42 U.S.C. 4901 {et Seq.}
(c) DoD Instruction 4715.13 of 15 Nov 2005
(d) SECNAVINST 11011.47A
(e) Federal Management Regulation, 41 CFR 102

Encl: (1) Air Installation Compatible Use Zones (AICUZ) Program
Procedures and Guidelines for Department of the Navy
Air Installations

1. Purpose. To revise Department of the Navy (DON) policy, procedures and guidelines for implementation of reference (a). This instruction provides guidance from the Chief of Naval Operations (CNO) and Commandant of the Marine Corps (CMC) responsible for management of the Air Installations Compatible Use Zones (AICUZ) program.

2. Cancellation. OPNAVINST 11010.36B.

3. Background

a. Reference (b) requires Federal agencies and State and local governments to develop measures to control the harmful effects of noise on people. The Department of Defense (DoD) initiated the AICUZ program to protect the public's health, safety, and welfare and to prevent encroachment from degrading the operational capability of military air installations in meeting national security.

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b. The AICUZ program recommends land uses that will be compatible with noise levels, accident potential and obstruction clearance criteria associated with military airfield operations. Program implementation procedures for the Navy and Marine Corps are contained in enclosure (1).

4. Discussion. The foundation of the AICUZ program is an active local command effort to work with local, State, regional, other Federal agencies, and community leaders to encourage compatible development of land adjacent to military airfields. The DON is particularly susceptible to such encroachment with many of its installations located in high growth urban areas. The AICUZ process involves four basic steps:

a. Develop, and periodically update, a study for each air installation to quantify aircraft noise zones and identify accident potential zones; develop a noise reduction strategy for impacted lands, both on and off the installation; prepare a compatible land use plan for the installation and surrounding areas; and develop a strategy to promote compatible development on land within these areas.

b. Develop a prospective long-term (5 to 10 years) AICUZ analysis to illustrate impact on potential future missions and how it will be implemented by the AICUZ program.

c. Implement the AICUZ plan for the installation including coordination with Federal, State, and local officials to maintain public awareness of AICUZ.

d. Identify and program property rights acquisition including encroachment partnering projects in critical areas where action to achieve compatibility within AICUZ program guidelines through local land use controls is not practicable, or has been attempted and proven unsuccessful in providing desired long-term encroachment protection.

5. Applicability. These procedures apply to all Navy and Marine Corps airfields within the confines of the United States, its territories, trusts and possessions. AICUZ studies, or portions thereof, may be developed for U.S. activities in

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foreign countries if such action supports host nation policy for protecting the operational capabilities of those activities, and for on-base facility planning goals.

6. Records Management. All records created by this instruction, regardless of format and media, shall be managed in accordance with Secretary of the Navy Manual 5210.1.

7. Action. Addressees shall comply with the procedures outlined herein.



E. G. USHER III
Deputy Commandant for
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AIR INSTALLATIONS COMPATIBLE USE ZONES (AICUZ)

PROGRAM PROCEDURES

AND

GUIDELINES

FOR

DEPARTMENT OF THE NAVY

AIR INSTALLATIONS

Enclosure (1)

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CHAPTER 1

THE PROCESS

1. THE AICUZ PROGRAM OBJECTIVES. The purpose of the AICUZ program is to achieve compatibility between air installations and neighboring communities by:

a. Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use which is compatible with aircraft operations;

b. Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities;

c. Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements, both on and in the vicinity of air installations; and

d. Informing the public about the AICUZ program and seeking cooperative efforts to minimize noise and aircraft accident potential impact by promoting compatible development in the vicinity of military air installations.

2. THE AICUZ STUDY. Each Navy and Marine Corps air installation designated by the CNO or the CMC has an AICUZ study which includes a detailed analysis of aircraft noise, accident potential, land use compatibility, operational alternatives, and recommended strategies to address existing and potential incompatible development in the vicinity of the air installation. All initial AICUZ studies have been completed and approved and are now updated when circumstances require such action. AICUZ areas depicted in these studies shall not be modified without CNO or CMC approval.

3. OPERATIONAL ALTERNATIVES. Each AICUZ study should normally include an evaluation of operational alternatives to reduce noise and Accident Potential Zone (APZ) impacts, e.g., flight track modifications, altering hours of operation, construction of acoustical enclosures, changes in pattern altitudes, etc. Evaluation of an operational alternative must balance noise and

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APZ changes with impacts on flight safety, operational capability, and cost. The decision to accept or reject a new alternative must be clearly presented. Proposed changes to already approved operational procedures will require documentation by the local command as to the reasons for the change along with notification and approval by the installation's chain of command. Environmental documentation in compliance with the National Environmental Policy Act (NEPA) may also be required.

4. IMPLEMENTATION. Each installation's AICUZ program implementation must be a continuous effort. Local command representatives should continually work toward achieving compatibility between the air installation and its neighboring communities, primarily through local land use controls. Land use controls outside the air installation, which are critical to limiting the number of people exposed to excessive noise and the potential for accidents, are under the exclusive control of State and local governments, and local commands should act only in an informational role. Land acquisition should be considered only in critical situations where State and local governments are unwilling or unable to enact land use controls to achieve land use compatibility within the AICUZ or where long-term land use controls are considered to be tenuous. Interests in land may be acquired via several methods. Land acquisition, for which Congressional authorization is normally required, will usually involve undeveloped land. The air installation should initially ensure chain of command support from the appropriate CNO or CMC resource sponsor, and then submit a land acquisition request via its chain of command for inclusion on the Military Construction (MILCON) Integrated Priority List (IPL). Alternatively, Encroachment Partnering (EP) with eligible entities, defined as states, counties, cities, and Non-Governmental Organizations (NGOs), enables the DON to leverage available funds to acquire interests in land (usually in the form of a restrictive use easement) to establish compatible buffers around the air installation.

CHAPTER 2

SIGNIFICANT CHANGES FROM PREVIOUS CNO/CMC GUIDANCE

1. Chapter 3, Table 2 and accompanying notes have been updated to provide additional Floor Area Ratio (FAR) maximum density measures in the "Trade" category of the land use compatibility guidelines for APZs. Updated density measures reflect the latest parking generation data.
2. Chapter 3, paragraph 2, Development of Noise Exposure Contours, has been updated to require incorporation of the Day-Night Average Sound Level/Community Noise Equivalent Level (DNL/CNEL) 60 noise contour for the purposes of notification and disclosure to the community of the presence of aircraft operations and to foster long term encroachment protection.
3. Chapter 7, Real Property Guidance, has been updated to reflect the new EP program, authorized by the Fiscal Year 2003 National Defense Authorization Act, as a tool to augment regional and local command efforts to protect and sustain the operational capability of air installations.
4. Chapter 8, Responsibilities, has been updated to reflect the establishment of Commander, Navy Installations Command (CNIC), Marine Corps regionalization, and the roles and responsibilities of mission component commands in support of the AICUZ program.

CHAPTER 3

NOISE EXPOSURE CONTOURS AND ACCIDENT POTENTIAL ZONE DEVELOPMENT

1. GENERAL. The core of an AICUZ program is a compatible land use plan developed for the air installation. The plan includes height and obstruction criteria for flight safety, as well as recommended land uses for areas exposed to different levels of noise and accident potential. These recommendations indicate the highest and best use of land (both on and off base), which are exposed to high levels of noise and/or aircraft accident potential.

2. DEVELOPMENT OF NOISE EXPOSURE CONTOURS. The initial step in the AICUZ process is preparation of a noise study to define noise exposure contours and compare them to prior noise contours published in the last approved AICUZ document. The noise contours are developed by a computerized simulation of aircraft activity at the installation and reflect site-specific operational data; e.g., flight tracks, type and mix of aircraft, aircraft profiles (airspeed, altitude, power settings), and frequency and times of operations. AICUZ program experience indicates that future year planning is necessary to consider the effects of expected changes in mission, aircraft, operational levels, etc. Therefore, in addition to the current year analysis, AICUZ updates will include an analysis of projected operations. The resultant noise contours will be referred to as the "prospective" noise contours. Projections of aircraft and aircraft operations will be based upon currently available unclassified estimates of future mission requirements. Where such estimates are not available, or where little or no change is expected in the next 5 to 10 years, the current year noise contours may also be used as the prospective noise contours. Noise impacts from aircraft operations will be graphically portrayed, and operational alternatives that could reduce noise impact on the installation and on the nearby community should be evaluated when practicable from the perspectives of aircraft safety and ability to maintain operational and training requirements. The installation shall recommend the most appropriate AICUZ footprint for approval by CNO/CMC.

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a. General

(1) The DNL noise descriptor will be used to describe the noise environment around airfields, except in the State of California where the CNEL descriptor will be used to describe the noise environment. If State or local laws require some other noise descriptor, it may be used in addition to DNL/CNEL. In addition, single event noise analysis can be used to augment the DNL/CNEL analysis, if appropriate as noted by the Federal Interagency Committee on Aircraft Noise.

(2) Since land use compatibility guidelines are based on yearly average noise levels, noise contours should be developed based on Average Annual Day (AAD) operations. However, where the documented nature of AAD air operations at a specific installation does not adequately represent the noise impacts at that installation, the Average Busy Day (ABD) can be used with supporting rationale.

(3) The operations level on an AAD is calculated by dividing the total annual airfield operations by 365 days. An ABD occurs when the airfield operations levels on a day are at least 50 percent of the AAD operations level. The ABD is calculated by determining the number of operations on busy days and dividing the total number of operations on those busy days by the number of busy days.

b. Noise Contours

(1) At a minimum, contours for DNL/CNEL 60, 65, 70, 75, and 80 shall be plotted on maps for Navy and Marine Corps air installations as part of AICUZ studies. Contours below 60 DNL are not required but may be provided if local conditions warrant discussion of lower noise levels or where significant noise complaints have been received in areas outside DNL 60.

(2) The NOISEMAP program will be used for developing noise contours for fixed-wing aircraft, and the Rotorcraft-Noise Model (RNM) program will be used for developing noise contours for rotary-wing and tilt-rotor aircraft operations until the Advanced Acoustic Model (AAM) is approved by DoD. AAM will replace NOISEMAP and RNM. AAM incorporates the features of NOISEMAP and RNM and also provides greater capabilities to model

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the next generation, high performance aircraft. The Naval Facilities Engineering Command (NAVFACENGCOM) will provide technical assistance to the Navy and Marine Corps once AAM is approved for use in developing noise exposure contours and other supplemental noise metrics.

c. Maintaining Operational Data. Each air installation is responsible for maintaining the operational data required to develop noise exposure contours. This data shall include aircraft operations at the airfield by aircraft type, runway utilization, and operation (approach, departure, Ground Control Approach (GCA), touch-and-go, Field Carrier Landing Practice (FCLP), etc.). If specific questions arise, standardized data packages and guidance for data acquisition and data maintenance at the local activity can be provided by NAVFACENGCOM.

d. Aircraft Noise Data

(1) NAVFACENGCOM is responsible for providing aircraft noise technical and policy guidance within the Department of Navy in the area of aircraft noise. Policy recommendations will be coordinated with the Deputy Commandant of the Marine Corps (Installations and Logistics), Facilities and Services Division, Land Use and Military Construction Branch (LFL) and mission component commands prior to implementation. Acoustic data for DoD aircraft for both flyover and ground runups are available through the DoD NOISEFILE database maintained at the Air Force's Wright-Patterson Research Laboratory at Wright-Patterson Air Force Base. Noise measurements for new aircraft and aircraft/engine upgrades will be acquired during the acquisition process. The DoD Noise Working Group, established through reference (c), will establish DoD-wide procedures and guidelines for collecting acoustic data. The Naval Air Systems Command (NAVAIRSYSCOM) is responsible for programming acoustic data acquisition for new weapons systems.

(2) The AICUZ Program Office at NAVFACENGCOM will coordinate with NAVAIRSYSCOM as appropriate to schedule and develop the noise measurement program as required. Programming for acoustic data collection for existing legacy aircraft is the responsibility of the Deputy Chief of Naval Operations (Fleet Readiness and Logistics), Shore Readiness Division (OPNAV (N46)) through the AICUZ Program Office at NAVFACENGCOM. Headquarters,

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Marine Corps (HQMC) is responsible for programming acoustic data collection for Marine Corps existing legacy aircraft after consultation with the AICUZ Program Office at NAVFACENGCOM.

e. Selection of Final Noise Contours to be used in the AICUZ Study. The selection criteria and rationale for the noise contours used must be documented in the request for approval of the AICUZ study. Selection of the recommended AICUZ footprint for approval (i.e., current year or prospective), shall be made by the activity, concurred with by the chain of command, and approved by CNO or CMC.

3. NOISE COMPATIBLE LAND USE GUIDELINES

a. For land use planning purposes, the noise exposure area is divided into three noise zones. Noise Zone 1 (DNL/CNEL 64 and below) is essentially an area of low or no impact. Noise Zone 2 (DNL/CNEL 65 to 74) is an area of moderate impact where some land use controls are needed. Noise Zone 3 (DNL/CNEL 75 and above) is the most severely impacted area and requires the greatest degree of compatible use controls. In addition to the noise zones, areas of concern may be defined where noise levels are not normally considered to be objectionable (less than DNL/CNEL 65), but land use controls are recommended in that particular area.

b. Land use compatibility information and general guidance, by land use category, is presented in Table 1. Further amplification is available from three sources: (1) "Standard Land Use Coding Manual" U. S. Department of Transportation, Federal Highway Administration, March 1977; (2) "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980; and (3) Federal Interagency Committee on Noise (FICON) "Federal Agency Review of Selected Noise Issues", August 1992. Where specific local land uses are not adequately described in the standard guidance documents, refinement and interpretation of the basic data is encouraged, within the constraints of accepted land use planning practice and with the approval of CNO/CMC. Recommended acceptable land use for AICUZ noise zones shall also consider sound attenuation measures imposed by zoning, building code requirements, or restrictive use easements. Where local authorities have adopted specific land use recommendations that

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are different than the criteria herein provided, the AICUZ study may incorporate and support the specific local criteria. However, land use planning recommendations proposed for publication in AICUZ documents that vary from Table 1 require CNO/CMC approval prior to public dissemination.

4. DEVELOPMENT OF FIXED WING AIRCRAFT APZs

a. General. The accident potential concept describes the probable impact area if an accident were to occur, which is to be distinguished from the probability of an accident occurring. Probable impact area information is based upon historical accident data. This data is used to determine: (1) the size of the clear zone and APZs I and II, and (2) suggested land use guidelines for each zone. Application of this concept includes not only statistical but operational considerations as well.

(1) Clear zones, areas immediately beyond the ends of runways and along primary flight paths, have the greatest potential for occurrence of aircraft accidents and should remain undeveloped. See Figure 1.

(2) The APZs illustrated in Figure 1 are provided for general guidance to protect the public from aircraft accident impact. Strict application will increase the safety of the general public but cannot provide complete protection from aircraft accidents. Local situations may differ significantly from these guidelines and may require individual study. Additionally, there may be cases where the number of flight operations per flight tracks does not meet the threshold criteria to designate APZs and additional analysis may be warranted. Where local authorities desire to implement different criteria than those herein included, to reflect specific local conditions, the AICUZ study may incorporate and support those criteria with approval of the CNO/CMC, as appropriate.

(3) DoD fixed-wing runways are separated into two classes for the purpose of defining accident potential areas. Class A runways are used primarily by light aircraft and do not have the potential for intensive use by heavy or high performance aircraft. Typically, these runways have less than 10 percent of their operations involving heavier aircraft and

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are usually less than 8,000 feet long. Class B runways are all other fixed-wing runways. NAVAIRSYSCOM and NAVFACENCOM concurrence and CNO/CMC approval is required prior to classifying or reclassifying any runway. Figure 1 illustrates the geometry of the clear zone and APZs I and II for both Class A and B runways.

b. Clear Zones and APZs (See Figure 1)

(1) Clear Zones. The area immediately beyond the usual runway threshold is designated the "Clear Zone." It is the area with the greatest potential for occurrence of aircraft accidents. Clear zones should remain undeveloped. Traditionally, the clear zone has been acquired by the Government in fee, or by restrictive use easements, to keep it clear of obstructions to flight. Due to the characteristics of flight operations at Navy and Marine Corps installations, the trapezoidal or "fan shaped" clear zone shall be used. The clear zone is required for all active runway ends.

(2) Accident Potential Zone I (APZ-I). APZ-I is the area beyond the clear zone which still possesses a measurable potential for accidents relative to the clear zone. APZ-I is provided under flight tracks which experience 5,000 or more annual fixed wing operations (departures or approaches, but not both combined). Figure 1 illustrates the normal dimensions for APZ-I which may be modified in accordance with paragraph 4c.

(3) Accident Potential Zone II (APZ-II). APZ-II is an area beyond APZ-I (or clear zone if APZ-I is not used) which has a measurable potential for aircraft accidents relative to APZ-I or the clear zone. APZ-II is used whenever APZ-I is required. If APZ-I is not warranted, APZ-II may still be used if an analysis indicates a need for it. In this case, rationale shall be provided for use of APZ-II and it shall be configured as shown on Figure 1, next to the clear zone. APZ-II may also be modified per paragraph 4c.

c. Modification of APZ. Modification of APZ-I and APZ-II for a particular flight path may be considered in the following situations:

(1) Fixed-wing aircraft do not operate on the extended runway centerline during normal flight operations. Modifications shall be made to align the zones to follow the projections of the aircraft flight track on the ground. The width of the curved APZ remains 3,000 feet.

(a) Where the flight track departs the runway centerline prior to crossing the clear zone, APZ-I will be 5,000 feet in length and APZ-II will be 10,000 feet in length, measured from the point the flight path leaves the runway centerline.

(b) Where the flight track passes through the side of the clear zone, APZ-I will be 5,000 feet in length and the length of APZ-II will be the difference between the total length of the clear zone and APZ-I and II (15,000 feet) less APZ-I and the distance the flight track traverses the clear zone. The distances are measured beginning at the point the flight path leaves the runway centerline.

(2) FCLP is typically an intense aircraft evolution and is viewed by the DON as an unusual operating condition as noted in reference (a). FCLP operations are usually conducted at night with several aircraft in the pattern at low altitude. At air stations, Outlying Landing Fields (OLF) and Auxiliary Landing Fields (ALF) where the operational criteria for application of APZ-I is satisfied due to FCLP operations, APZ-II should be applied to the entire FCLP track beyond APZ-I resulting in a closed loop for the entire pattern.

(3) Specific conditions may also point toward modification of the standard APZ geometry or application. In these situations, supporting rationale shall be coordinated with the AICUZ Program Office in advance and documented in the AICUZ study/update. Situations in which APZ modifications could be considered include, but are not limited to, the following:

(a) Where multiple flight tracks exist for a specific operation (e.g., arrival, departure, FCLP, GCA, etc.) which intersect the runway centerline and 5,000 operations exist by combining numbers on similar mode flight tracks. APZ should be centered on the dominant flight tracks(s) with the most operations.

(b) Where other unusual conditions exist and can be documented.

(4) CNO/CMC coordination and approval is required prior to any modification of an installation's APZ.

5. DEVELOPMENT OF ROTARY WING AIRCRAFT APZ

a. Basis for Clear Zone and APZ Application. The clear zone for rotary wing aircraft will be provided for all Visual Flight Rules (VFR) landing pads/runways. The use of APZ-I will be provided for VFR landing pads/runways located at air installations that support daily training and operational missions. Normally, helipads provided to support administrative functions and hospitals, which generate a low volume of helicopter operations, will not require APZ-I or APZ-II. Since extensive land use controls apply to Instrument Flight Rules (IFR) primary surface areas; additional clear zones and APZ are normally not required for IFR helicopter facilities due to extensive IFR primary surface area.

b. Clear Zone and APZs

(1) Clear Zone. The takeoff safety zone for VFR rotary-wing facilities shall be used as the clear zone. The takeoff safety zone is that area under the VFR approach/departure surface until that surface is 50 feet above the established landing area elevation.

(2) APZ-I. An area beyond the clear zone for the remainder of the approach/departure zone, which is defined as the area under the VFR approach/departure surface until that surface is 150 feet above the established landing area elevation.

(3) APZ-II. Normally not applied to helicopter flight paths unless the local accident history indicates the need for additional protection.

6. APZs COMPATIBLE LAND USE GUIDELINES. Recommended land use compatibility guidelines for clear zones and APZs are shown in Table 2. Local planning and zoning authorities may desire to

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implement different criteria than those included herein, to reflect specific local conditions. CNO/CMC approval is required prior to an installation's public support of any criteria other than that contained in this instruction. FAR is the ratio between square feet of floor area and square feet of site area based on parking generation requirements, vehicle occupancy rates, and desired maximum density. For APZs I and II, recommended FARs were calculated to achieve a maximum density of 25 and 50 people per acre, respectively. It is commonly used to identify population density or intensity for non-residential structures or land uses. The maximum FAR recommendations in Table 2 are provided as an aid to local officials and installation personnel considering restrictions on the density/intensity of non-residential development in APZ. However, it is not realistic to state that one numerical density is safe while another is not. The objective is to maximize the degree of safety that can reasonably be attained within local land use considerations.

7. OBSTRUCTION AND SAFETY CLEARANCES. This instruction addresses compatible land use with respect to aircraft noise and accident potential. Land uses in the vicinity of air installations are also subject to aircraft safety clearances and height restrictions. These restrictions are included by reference in this Instruction based upon Tri-Service criteria published in Unified Facilities Criteria's UFC-3-260-01. Additionally, the following should be reviewed for compatibility with airfield operations within the installation operating environs:

- a. Land uses that may cause smoke, dust, or steam that could obscure aircrew vision;
- b. Land uses that generate direct and indirect lighting that could interfere with pilot vision, including, but not limited to, searchlights, lasers, and fireworks;
- c. Land uses that may cause electromagnetic interference with aircraft navigation, communication or weapons systems; and
- d. Land uses that may attract birds, such as landfills, wastewater treatment facilities, dredge disposal sites, seafood processing plants, etc.

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8. AICUZ COMPATIBLE LAND USE IMPLEMENTATION

a. DoD policy is to work toward promoting compatible land use development in the vicinity of air installations, and to encourage local governments to incorporate the AICUZ study recommendations into local land use planning and control process. This process includes, but is not limited to, zoning and subdivision ordinances and building codes. Land use planning must address long-range strategies involving present and future land use and development. Application of land use control strategies often does not result in immediate changes in land use development in the areas subject to the specific requirements or restrictions. Additionally, since land use planning is a long-range process, communities cannot be expected to continually change their comprehensive plans to reflect frequent changes in Navy/Marine Corps noise contours and APZ. Frequent changes can also undermine support for the program and may be counterproductive to the goal of community support for the AICUZ program. Hence, it is imperative that AICUZ studies consider not only current but also realistic 5- to 10-year projections of airfield operations when making land use planning recommendations.

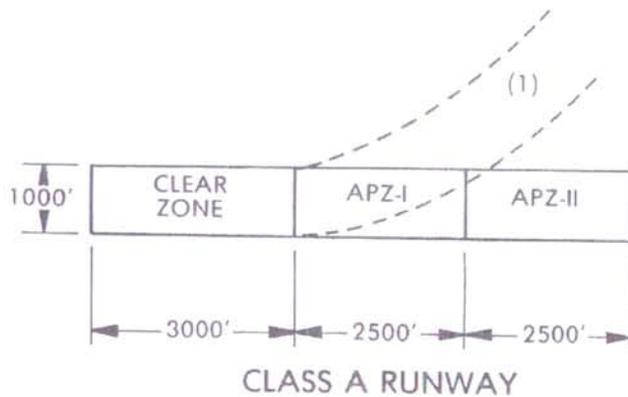
b. The AICUZ study or update shall include recommended land uses based on recognized guidelines and sound planning principles. The AICUZ boundary is generally defined as that area contained within the accident potential and noise zones. The development of the final boundary of the AICUZ shall also take into account natural and manmade features that can impact land use development underlying the imaginary surfaces of the airfield. The study recommendations shall be based on current operations levels and the best available (5- to 10-year) projection of operations to ensure the future operational capability of the air installation. This information will be provided to local government agencies with the recommendation that it be incorporated into the local planning and regulatory process. Land use compatibility guidelines within noise zones are shown in Table (1), and land use compatibility guidelines within APZs are outlined in Table (2).

c. The recommendations regarding compatible land use within each zone may vary according to local conditions. The primary

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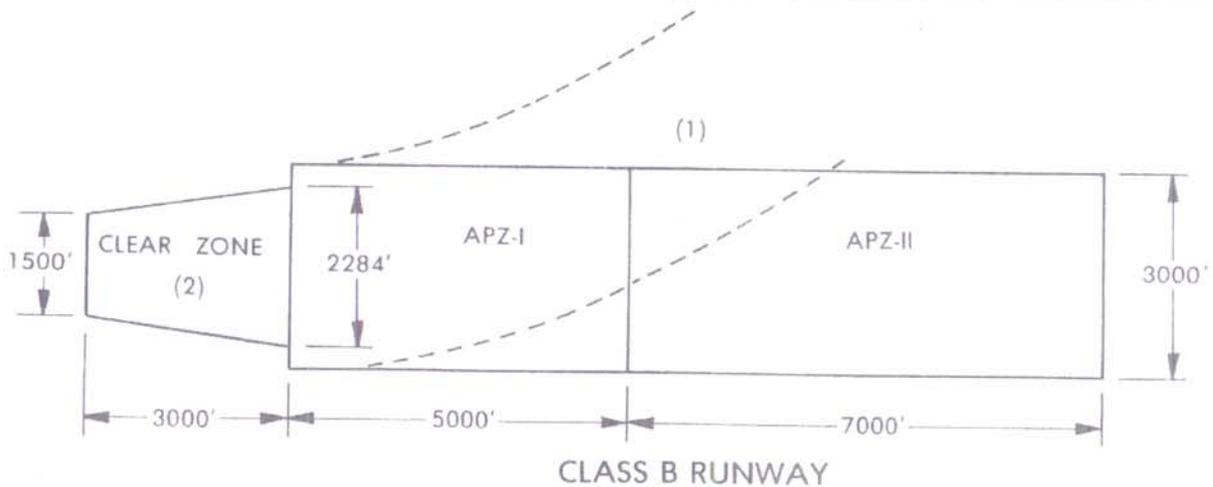
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objectives will be to identify areas within the AICUZ that can be affected by air operations; to share information with local government agencies that regulate land use, and to recommend restrictions on incompatible development. Local governments may choose to provide for additional land use controls outside the AICUZ boundary based on local economic and social concerns with the intent of providing long-term encroachment protection. Such actions by local governments should be encouraged since they can have the effect of implementing long-term land use development and smart growth initiatives



Notes;

- (1) APZ I and II may be altered to conform to flight shadow.
 - (2) The 2284' dimension is based on criteria of using a 7°-58'-11" flare angle for the approach departure surface where the outer width of that surface was established at 15,500'. This dimension would be 2312' where the outer width of the surface was established at 16,000'.
- (See UFC-3-260-01)



[See NAVFAC UFC-3-260-01 for additional details. Flare starts at 200' from end of runways and the 3000' clear zone length starts at runway end]

FIGURE 1 - FIXED WING ACCIDENT POTENTIAL ZONES

**TABLE 1 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES**

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
10	Residential							
11	Household Units	Y	Y ¹	N ²	N ¹	N	N	N
11.11	Single units: detached	Y	Y ¹	N ²	N ¹	N	N	N
11.12	Single units: semidetached	Y	Y ¹	N ²	N ¹	N	N	N
11.13	Single units: attached row	Y	Y ¹	N ²	N ¹	N	N	N
11.21	Two units: side-by-side	Y	Y ¹	N ²	N ¹	N	N	N
11.22	Two units: one above the other	Y	Y ¹	N ²	N ¹	N	N	N
11.31	Apartments: walk-up	Y	Y ¹	N ²	N ¹	N	N	N
11.32	Apartment: elevator	Y	Y ¹	N ²	N ¹	N	N	N
12	Group quarters	Y	Y ¹	N ²	N ¹	N	N	N
13	Residential Hotels	Y	Y ¹	N ²	N ¹	N	N	N
14	Mobile home parks or courts	Y	Y ¹	N	N	N	N	N
15	Transient lodgings	Y	Y ¹	N ²	N ¹	N ¹	N	N
16	Other residential	Y	Y ¹	N ²	N ¹	N	N	N
20	Manufacturing							
21	Food & kindred products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
22	Textile mill products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
24	Lumber and wood products (except furniture); manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
25	Furniture and fixtures; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
26	Paper and allied products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
27	Printing, publishing, and allied industries	Y	Y	Y	Y ²	Y ³	Y ⁴	N
28	Chemicals and allied products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
29	Petroleum refining and related industries	Y	Y	Y	Y ²	Y ³	Y ⁴	N

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**TABLE 1 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES (Continued)**

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO.	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
30	Manufacturing (continued)							
31	Rubber and misc. plastic products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
32	Stone, clay and glass products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
33	Primary metal products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
34	Fabricated metal products; manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	Y	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y	Y	Y ²	Y ³	Y ⁴	N
40	Transportation, communication and utilities							
41	Railroad, rapid rail transit, and street railway transportation	Y	Y	Y	Y ²	Y ³	Y ⁴	N
42	Motor vehicle transportation	Y	Y	Y	Y ²	Y ³	Y ⁴	N
43	Aircraft transportation	Y	Y	Y	Y ²	Y ³	Y ⁴	N
44	Marine craft transportation	Y	Y	Y	Y ²	Y ³	Y ⁴	N
45	Highway and street right-of-way	Y	Y	Y	Y ²	Y ³	Y ⁴	N
46	Automobile parking	Y	Y	Y	Y ²	Y ³	Y ⁴	N
47	Communication	Y	Y	Y	25 ⁵	30 ⁵	N	N
48	Utilities	Y	Y	Y	Y ²	Y ³	Y ⁴	N
49	Other transportation, communication and utilities	Y	Y	Y	25 ⁵	30 ⁵	N	N
50	Trade							
51	Wholesale trade	Y	Y	Y	Y ²	Y ³	Y ⁴	N
52	Retail trade - building materials, hardware and farm equipment	Y	Y	Y	Y ²	Y ³	Y ⁴	N
53	Retail trade - shopping centers	Y	Y	Y	25	30	N	N
54	Retail trade - food	Y	Y	Y	25	30	N	N
55	Retail trade - automotive, marine craft, aircraft and accessories	Y	Y	Y	25	30	N	N
56	Retail trade - apparel and accessories	Y	Y	Y	25	30	N	N

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**TABLE 1 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES (Continued)**

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO.	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
57	Retail trade - furniture, home, furnishings and equipment	Y	Y	Y	25	30	N	N
58	Retail trade - eating and drinking establishments	Y	Y	Y	25	30	N	N
59	Other retail trade	Y	Y	Y	25	30	N	N
60	Services							
61	Finance, insurance and real estate services	Y	Y	Y	25	30	N	N
62	Personal services	Y	Y	Y	25	30	N	N
62.4	Cemeteries	Y	Y	Y	Y ²	Y ³	Y ^{6,11}	Y ^{6,11}
63	Business services	Y	Y	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y	Y	Y ²	Y ³	Y ⁴	N
64	Repair Services	Y	Y	Y	Y ²	Y ³	Y ⁴	N
65	Professional services	Y	Y	Y	25	30	N	N
65.1	Hospitals, other medical fac.	Y	Y ¹	25	30	N	N	N
65.16	Nursing Homes	Y	Y	N ¹	N ¹	N	N	N
66	Contract construction services	Y	Y	Y	25	30	N	N
67	Government Services	Y	Y ¹	Y ¹	25	30	N	N
68	Educational services	Y	Y ¹	25	30	N	N	N
69	Miscellaneous	Y	Y	Y	25	30	N	N
70	Cultural, entertainment and recreational							
71	Cultural activities (& churches)	Y	Y ¹	25	30	N	N	N
71.2	Nature exhibits	Y	Y ¹	Y ¹	N	N	N	N
72	Public assembly	Y	Y ¹	Y	N	N	N	N
72.1	Auditoriums, concert halls	Y	Y	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	Y	Y ¹	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	Y ¹	Y ¹	N	N	N
73	Amusements	Y	Y	Y	Y	N	N	N
74	Recreational activities (include golf courses, riding stables, water rec.)	Y	Y ¹	Y ¹	25	30	N	N
75	Resorts and group camps	Y	Y ¹	Y ¹	Y ¹	N	N	N
76	Parks	Y	Y ¹	Y ¹	Y ¹	N	N	N
79	Other cultural, entertainment and recreation	Y	Y ¹	Y ¹	Y ¹	N	N	N
80	Resource Production and Extraction							
81	Agriculture (except live stock)	Y	Y	Y ⁸	Y ⁹	Y ¹⁰	Y ^{10,11}	Y ^{10,11}

**TABLE 1 - AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES (Continued)**

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (DNL or CNEL)		Noise Zone 2 (DNL or CNEL)		Noise Zone 3 (DNL or CNEL)		
SLUCM NO.	LAND USE NAME	< 55	55- 64	65 - 69	70 -74	75- 79	80 -84	85+
81.5	Livestock farming	Y	Y	Y ⁵	Y ⁵	N	N	N
81.7	Animal breeding	Y	Y	Y ⁵	Y ⁵	N	N	N
82	Agriculture related activities	Y	Y	Y ⁵	Y ⁵	Y ¹⁰	Y ^{10,11}	Y ^{10,11}
83	Forestry Activities	Y	Y	Y ⁵	Y ⁵	Y ¹⁰	Y ^{10,11}	Y ^{10,11}
84	Fishing Activities	Y	Y	Y	Y	Y	Y	Y
85	Mining Activities	Y	Y	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y	Y	Y

KEY TO TABLE 1 - SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES

SLUCM Standard Land Use Coding Manual, U.S. Department of Transportation

Y (Yes) Land Use and related structures compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

Y* (Yes with Restrictions) The land use and related structures are generally compatible. However, see note(s) indicated by the superscript.

N* (No with exceptions) The land use and related structures are generally incompatible. However, see notes indicated by the superscript.

NLR (Noise Level Reduction) NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35 The numbers refer to NLR levels. Land Use and related structures generally compatible however, measures to achieve NLR of 25, 30 or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.

DNL Day Night Average Sound Level.

CNEL Community Noise Equivalent Level (normally within a very small decibel difference of DNL)

Ldn Mathematical symbol for DNL.

NOTES FOR TABLE 1 - SUGGESTED LAND USE COMPATIBILITY
IN NOISE ZONES

1. General

a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65 to 69 and strongly discouraged in DNL 70 to 74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.

b. Where the community determines that these uses must be allowed measures to achieve and outdoor to indoor NLR of at least 25 Decibels (dB) in DNL 65 to 69 and NLR of 30 dB in DNL 70 to 74 should be incorporated into building codes and be in individual approvals; for transient housing a NLR of at least 35 dB should be incorporated in DNL 75 to 79.

c. Normal permanent construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

d. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design and use of berms and barriers can help mitigate outdoor noise exposure NLR particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the