DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000
and
HEADQUARTERS UNITED STATES MARINE CORPS
3000 MARINE CORPS PENTAGON
WASHINGTON, DC 20350-3000

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28 Jan 08

OPNAV INSTRUCTION 3550.1A
MARINE CORPS ORDER 3550.11

From: Chief of Naval Operations
Commandant of the Marine Corps

Subj: RANGE AIR INSTALLATIONS COMPATIBLE USE ZONES (RAICUZ) PROGRAM

Ref: (a) OPNAVINST 11010.36B
(b) OPNAVINST 5090.1B
(c) MCO P5090.2 (NOTAL)
(d) MCO 3550.10
(e) MCO 3570.1B
(f) OPNAVNOTE 11010 (NOTAL)
(g) DOD Directive 3200.15 of 10 Jan 03
(h) OPNAVINST 5100.27A/MCO 5104.1B
(i) OPNAVINST 3770.2

Encl: (1) RAICUZ Program Procedures and Guidelines for Air-to-Ground Range Installations

1. Purpose. To revise Department of the Navy policy, procedures, and guidelines for implementation of the RAICUZ Program. This instruction provides guidance from the Chief of Naval Operations and Commandant of the Marine Corps.

2. Cancellation. OPNAVINST 3550.1.

3. Background. The Department of the Navy's RAICUZ program is designed to protect public health, safety, and welfare, and to prevent encroachment from degrading the operational capabilities of air-to-ground ranges. This program is similar to the Air Installations Compatible Use Zones (AICUZ) Program issued by reference (a). The RAICUZ program includes range safety and noise analyses, and provides land use recommendations which will be compatible with Range Compatibility Zones (RCZs) and noise

levels associated with the military range operations. Program implementation procedures for the Navy and Marine Corps are contained in enclosure (1).

4. Discussion. The RAICUZ Program depends upon the installation commander's efforts to work with the nearby communities and other federal, state, local agencies and federally recognized Native American tribes to prevent incompatible development of land adjacent to military training ranges. The RAICUZ process involves four steps:

a. Develop, and periodically update, a RAICUZ Study for each air-to-ground range installation to quantify range compatibility zones and aircraft noise zones; consult with stakeholders to develop strategies for lands affected by potential weapons or noise impacts, both on and off the range; prepare a compatible land use plan for the range and surrounding areas; and develop a strategy to promote compatible development on land within these areas.

b. Develop a near-term RAICUZ analysis to illustrate impact of known future missions on RAICUZ implementation.

c. Implement the RAICUZ Study for the installation including coordination with federal, state, and local officials to maintain public awareness of RAICUZ.

d. Identify and program land acquisition in critical areas where actions to achieve compatibility within the RAICUZ through local land controls appears unlikely.

5. Responsibilities. The Deputy Chief of Naval Operations, CNO for Fleet Readiness and Logistics (N4), provides relevant policy, resources, structures, and mechanisms to meet leadership

defined readiness requirements of Navy operating forces and their associated shore installations.

a. CNO (N46) (Director, Ashore Readiness) plans and programs resources for the RAICUZ program.

b. CNO (N43) (Director, Fleet Readiness) as director of the Navy Range Office, ensures Navy Policy and decision making support the Fleet's tactical warfighter requirements.

c. Commander Fleet Forces Command (CFFC), is responsible for approving all operational requirements on Navy training

ranges, programming resources for new Weapon Danger Zones (WDZs) tool and approving waivers to standard modeling protocols for training ranges and the WDZ (SAFE-RANGE) computer software tool.

d. Commander, Naval Strike and Air Warfare Center (NSAWC), is responsible for developing all Navy tactics, techniques and procedures (TTP) that are employed on Navy ranges. Marine Corps aviation TTP tactics are standardized and taught by Marine Air Ground Task Force Training Command and Marine Aviation Weapons and Tactics Squadron One.

e. Commander Navy Installations Command (CNI)(N5), as the RAICUZ program executive agent, provides technical expertise, policy oversight and program management for the Navy.

f. The Deputy Commandant for Installations & Logistics (DC I&L) acts on behalf of the Commandant in designated matters of installations and logistics policy and management. DC I&L shall exercise approval authority and responsibility for the RAICUZ program within the Marine Corps.

g. The Commanding General, Marine Corps Combat Development Command (CG MCCDC) (C465) is the executive agent and resources sponsor for aviation and ground range and training area (RTA) management programs, and the proponent for all range safety matters.

6. Applicability. This instruction applies to all Navy and Marine Corps air-to-ground range installations within the confines of the United States, its territories, trusts, and possessions. RAICUZ studies, or portions thereof, may be developed for U.S. activities in foreign countries if such action supports host nation policy for protecting the operational capabilities of those activities, or for on base U.S. facility planning goals.

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

E. G. USHER III
Deputy Commandant for
Installations and Logistics

M. E. LOOSE
Vice Admiral, CEC, U.S. Navy
Deputy Chief of Naval Operations
(Fleet Readiness and Logistics)

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OPNAVINST 3550.1A
MCO 3550.11
28 Jan 08

DEPARTMENT OF THE NAVY

RANGE AIR INSTALLATIONS COMPATIBLE USE ZONES

RAICUZ

PROGRAM PROCEDURES

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SECTION I

1. OBJECTIVE

1.1. THE RAICUZ PROGRAM OBJECTIVES

The objective of the RAICUZ program is to achieve compatibility between air-to-ground ranges, existing and proposed land use, and airspace in the vicinity of the range installation by meeting the following primary objectives:

1.1.1. Precluding public exposure to hazards and noise associated with air-to-ground ranges;

1.1.2. Protecting Navy and Marine Corps investment by safeguarding the current and potential operational capabilities of those ranges;

1.1.3. Promote compatible land use near air-to-ground ranges;

1.1.4. Informing the public about the RAICUZ program and seeking cooperative efforts to minimize potential safety and noise impacts in the vicinity of the air-to-ground ranges;

1.1.5. Establishing working relationships between the installation and appropriate local, regional and state community councils, commissions, Indian tribes and planning and zoning departments in order to mutually communicate proposed actions that could affect public health, safety and welfare as well as operational and training capabilities and compatible land use recommendations.

1.2. REQUIREMENTS

Each Navy and Marine Corps air-to-ground range shall have a RAICUZ study including a detailed analysis of current and future range utilization, special use airspace, range compatibility use zones, aircraft noise, ordnance noise, and land use compatibility. Plans shall be updated as necessary to account for new aircraft, weapons, and/or tactics or when special circumstances, such as an approved training requirement, dictate such action.

1.3. APPROACH

Developing the RAICUZ study requires establishing Range Compatibility Zones (RCZs) and modeling aircraft noise and ordnance noise. Should the weapon danger zone footprint extend beyond the range boundary, or excessive noise levels present an unacceptable potential impact to off-range sites, the RAICUZ plan will require an analysis of alternatives to achieve land use compatibility. Alternatives must balance changes in potential weapons and noise impacts with effects on safety, operational capability, and training/testing requirements. For the Marine Corps, reference (e) provides guidance regarding the establishment of weapon danger zone footprints. Approval by the cognizant service (CNO (N46)/CMC (LF)) is required prior to plan implementation.

1.4. AIRSPACE CONSIDERATIONS

Special Use Airspace (SUA) associated with ranges includes restricted areas for ordnance delivery and Military Operations Areas (MOA) for high-speed air combat maneuvering. In addition, low-level Military Training Routes (MTR) are sometimes established and utilized to provide ingress and egress to the training ranges. This airspace is critical to flight safety to ensure the proper degree of separation exists between non-participating aircraft and hazardous operations.

To insure that sufficient range and airspace capacity will be available to support existing and future mission requirements, an analysis of special use airspace may need to be conducted for each range/range complex. Findings and recommendations will be administered per reference (i).

The Department of the Navy's Naval Aviation Simulation Model (NASMOD) was developed to enable planners to evaluate complex airfield, range, and airspace scenarios. NASMOD is an effective tool in determining range and airspace capacity and for supporting proposals for new special use airspace, if required, to meet mission requirements. In addition to providing the capability to fully assess military airspace training requirements, the impact to military training requirements from proposed changes in civilian and general aviation operations can be fully evaluated.

1.5. OTHER CONSIDERATIONS

1.5.1. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

Potential changes in operational procedures or aircraft activity at the range may require preparation of a RAICUZ study or an update. These changes may constitute a major federal action requiring the action proponent to prepare appropriate National Environmental Policy Act (NEPA) documentation, in accordance with references (b) and (c). Proposals for use of new platforms, weapons or tactics that could result in a change to the environmental status quo (such as increases in off range noise or the size/location of RCZs) require preparation of NEPA documentation prior to implementation.

If NEPA documentation is required, it is important to remember that some range operations may have the potential to adversely impact cultural resources such as historic structures, archeological sites, Native American rock art, traditional cultural properties and Native American sacred sites, located within the RAICUZ zones. Such impacts may require Section 106 consultation of the National Historic Preservation Act (NHPA) as well as other historic preservation legislation. Thus, consultation with appropriate State Historic Preservation Officers (SHPO) and other interested parties is an integral part of the NEPA study and should be initiated early in the NEPA process. Consultation between Federal agencies and Native American tribes is also mandated under several Federal laws. Issues that are often a concern for Native American tribes include construction, training, land use, low-level over flights, ecosystem management of ancestral lands, protection of ancestral sites and sacred sites from vandalism, and access to sacred sites, subsistence and medicinal natural resources.

1.5.2. LASER ANALYSIS

The use of lasers within the range and training area will be governed by the appropriate service range safety policies per reference (h).

1.5.3. IMPLEMENTATION

RAICUZ implementation must be a continuous effort at each installation, range and training area. Respective Installation Commanders should support the personnel responsible for working toward achieving compatible land uses between the range and the

surrounding area; for the Marine Corps, this is the Community Plans and Liaison Office (CPLO) or other officials as appropriate. The responsible personnel should consider available strategies including land use controls, compatible zoning, land acquisition in fee or restrictive easements, special use permits, encroachment partnering, and withdrawal of public domain lands. As a means of accomplishing compatibility, local commands are encouraged to participate in partnering efforts with adjacent landowners, users, community councils, commissions, and planning and zoning agencies. Installation Commanders have the primary responsibility to provide input to the local community on installation activities that might impact them. This includes noise emanating from military ranges and training. Successful implementation of a RAICUZ study involves coordination with federal, state, regional, local agencies and federally recognized Indian tribes as appropriate.

SECTION II

2. RESPONSIBILITIES

2.1 The Deputy Chief of Naval Operations CNO for Fleet Readiness and Logistics (N46) plans and programs for afloat/ashore readiness and logistics programs, and ensures the effective and efficient employment of resources in meeting validated requirements. N46 shall:

2.1.1. Fund all Navy RAICUZ studies and RAICUZ Updates.

2.1.2. Exercise approval authority over Navy RAICUZ studies.

2.2. Commander Navy Installations Command (CNIC)(N5), as the executive agent for N46, directs the Navy RAICUZ program and is responsible for ensuring that a RAICUZ is prepared for each Range/Range Complex; and that updates are prepared when changes to the Range or its mission occur. CNIC shall:

2.2.1. Directs the Navy Centers of Excellence (COE) and Navy Regions, in the implementation of the policies and principles of the RAICUZ program;

2.2.2. Direct CNI subordinate components to implement the Navy RAICUZ recommendations;

2.2.3. Develop and conduct an education program for installation, chain of command and other cognizant DOD and non-DOD individuals regarding the policies, purposes and strategies of the Navy RAICUZ program;

2.3. The Commander, Naval Facilities Engineering Command shall:

2.3.1. Integrate the Navy RAICUZ planning process into Shore Infrastructure Program (SIP) for Navy complexes or activities and activity master plans for the Marine Corps.

2.3.2. Provide technical direction and planning support for the reduction of noise emanating from aircraft flight and test operations on Navy and Marine Corps ranges.

2.3.3. Ensure that program tools are available.

2.3.4. Establish East and West Coast Centers of Excellence (COE) to coordinate Navy RAICUZ issues with Regional Commanders and installations within their area of responsibility.

2.4. Navy Regional Commanders provide implementation guidance, priorities and recommendations in RAICUZ plans submitted under their cognizance; and

2.4.1. Coordinate with Mission Component Commands who establish operational requirements.

2.4.2. Ensure that ranges within their AOR have current RAICUZ Studies.

2.4.3. And ensures that any approved operational changes to their range are included within the RAICUZ study and updated local Range Operating Instructions.

2.5. Commander Fleet Forces Command, (N7), Fleet Training Directorate is responsible for developing requirements for all Navy ranges. FFC (N7) shall:

2.5.1. Fund and approve weapon safety analysis studies which will directly feed RAICUZ studies per reference (d) and possible follow on NEPA documentation, if required.

2.5.2. Review all Navy RAICUZ Studies.

2.5.3. Fund, review and approve all new WDZ's.

2.5.4. Approve all waivers for alternative modeling methodologies and WDZ's. FFC has the authority to delegate this authority and to develop guidance for alternative modeling methodologies.

2.5.5. Fund the development and sustainability of WDZ program tools.

2.5.6. Provide subordinate commanders assistance in identifying future training requirements that may require additional range training resources.

2.6. The Naval Strike and Air Warfare Center (NSAWC) shall develop and or approve all Strike Warfare tactics used on Navy ranges.

2.7. The Assistant Deputy Commandant for Installations & Logistics, Facilities and Services Division (ADC I&L-LF) as the Marine Corps RAICUZ program executive agent, provides environmental and compatible land use policies, plans, and programs related to Range and Training Area (RTA) operations, and provides concept review for Marine Corps Land and Airspace Use Requirements studies. ADC I&L (LF) shall:

2.7.1. Exercise management responsibility for the Marine Corps RAICUZ Program.

2.7.2. Provide technical assistance and guidance to Marine Corps organizations regarding RAICUZ policy decisions and implementation.

2.7.3. Promote a RAICUZ education program in cooperation with CNIC (N5).

2.7.4. Provide concept review and recommendations for Marine Corps RAICUZ plans.

2.7.5. Fund Marine Corps RAICUZ Studies.

2.7.6. Coordinate with Commanding General (CG), Marine Corps Combat Development Command (MCCDC) (C465) on all matters pertaining to Weapon Danger Zones (WDZ) development.

2.8. CGMCCDC (C465) is the executive agent and resources sponsor for aviation and ground Range and Training Area (RTA) management programs, and the proponent for all range safety matters.

2.9. The Commanding General, Training and Education Command (TECOM) provides for the development, coordination, resourcing, execution, and evaluation of training and education concepts, policies, plans and programs.

2.10. Commanders, Marine Forces (COMMARFORs) are responsible for approving operational requirements for RTAs within their respective geographic Area Of Responsibility (AOR) and shall:

2.10.1. Review Marine Corps RAICUZ Studies

2.10.2. Coordinate with Mission Component Commands who establish operational requirements, to be included in the RAICUZ analysis.

2.10.3. Ensure that ranges in their AOR have current RAICUZ Studies.

2.10.4. Ensure that any approved operational changes to the range are included within the RAICUZ Study and local Installation Range Standard Operating procedures (SOP).

2.10.5. Endorse RAICUZ studies prior to approval by CMC.

2.11. Commanding Generals, Marine Corps Installation (MCI) regions identify, prioritize, and support installation facility requirements for RTAs and provide implementation guidance, priorities and recommendations in RAICUZ Studies submitted under their cognizance.

2.12. Commanding Officers, Marine Corps Bases and Air stations implement the RAICUZ Study at the respective installation, range and training area.

2.12.1. Maintain documentation on the implementation of the RAICUZ Study. Such documentation should contain, among other things, a chronological narrative of important events, newspaper articles, operational data and references aerial and ground photographs, and pertinent correspondence.

2.12.2. Comply with Marine Corps range safety instructions for the development and maintenance of a composite Weapons Danger Zone footprint for all air-to-ground ranges under the control of the command.

SECTION III

3. RANGE COMPATIBILITY ZONES (RCZs)

3.1. GENERAL

A principal component of the RAICUZ study is a compatible land use plan specifically tailored for each range.

For land use planning purposes, RCZ's define areas based on a level of protection to public health, safety, and welfare and to recommend compatible land uses to prevent encroachment from degrading the operational capability of the air to ground ranges. Range Compatibility Zone-I (RCZ-I) defines the area of the greatest potential safety hazard and designates the minimum range surface area needed to contain all ordnance delivered at air-to-ground ranges. Range Compatibility Zone-II (RCZ-II) defines the area of armed over flight. Range Compatibility Zone-III (RCZ-III) is the area under the restricted airspace used by aircraft for tactical maneuvering over the range. RCZ's are not predictors of safety hazards but depict areas where mishaps are likely to occur if they occur.

It is the responsibility of range control/safety officials to determine the appropriate positioning of range structures, personnel, and troops conducting training.

3.2. DEVELOPMENT OF AIR-TO-GROUND RCZ's

RCZ's translate aviation safety and ordnance delivery safety concerns into recommended compatible land use zones. RSZ size is not affected by the number of annual range operations, but is based upon the types of operations performed as outlined in current local Range Operations Manuals or Instructions. RCZ's are used as the basis for designating types of compatible land use with the public's safety in mind both on and off the military range. RCZ land use recommendations are more stringent than those for noise impacts because the possible consequences of incompatible development are more serious. For land use planning purposes, the RCZ's are divided into three zones: RCZ-I, RCZ-II and RCZ-III.

3.2.1. Range Compatibility Zone-I (RCZ-I)

RCZ-I is the composite footprint based on each of the individual Weapons Danger Zones (WDZ), associated with air-to-ground weapons delivery, and represents the entire weapons impact area (including potential ricochets). WDZ is a new term replacing Weapon Safety Footprint Area, thereby making all DoD Service technology uniform and consistent with NATO.

The Weapons Danger Zone (WDZ) encompasses the ground and airspace for lateral and vertical containment of projectiles, fragments, debris and components resulting from the firing, launching and/or detonation of aviation delivered ordnance. This three-dimensional zone accounts for weapon accuracy, failures, ricochets, and broaches/porpoising of a specific weapon/munitions type delivered by a specific aircraft type. WDZ's represent the minimum safety requirements designed for aviation weapons training on DoD ranges.

The composite WDZ is developed in accordance with the respective services' range safety policies. RCZ-I is the most restrictive of the three RCZ's; there are no compatible land uses permitted within the RCZ-I (see Appendix A). If specific situations require the establishment of the RCZ-I outside the range boundary, efforts to either acquire the necessary property or negotiate a use agreement with the owner or agent controlling the land should be made and forwarded for approval. Again, the composite WDZ (RCZ-I), which is the summation of all applicable WDZ's acceptable for a particular range, is the minimum area needed to contain approved ordnance delivered from aircraft.

The composite WDZ (CWDZ) will be constructed utilizing service approved modeling software.

Multiple CWDZ's is an acceptable means to accurately depict operational risk (e.g., a CWDZ for routine training and a more heavily mitigated CWDZ for less frequent and/or non-routine operations.)

The currently approved model for developing WDZ's is SAFE-RANGE, a multi-Service approved modeling software based on algorithms (WDZ Tool is currently being developed and will replace SAFE-RANGE). For the Navy, other modeling methodologies may be approved on a case by case basis by Commander, Fleet Forces Command (N7). Modeling shall incorporate the best scientific methodologies and Operational Risk management Procedures. For the Marine Corps, reference (e) provides guidance for the development of WDZs and the policy and procedures for deviations.

In some instances, multiple RCZ-I footprints may be required to properly document the activities at a range and accurately communicate risks and required mitigation in support of air-to-ground operations. Multiple RCZ-I development is generally beneficial at small ranges that only occasionally support higher risk operations on an annual basis. Examples include individual RCZ-I depictions for unit level training (ULT), precision guided munitions (PGM) or larger scale exercises (LSE). Separate mitigation would be developed and executed for each RCZ-I requirement.

There will be a final Composite RCZ-I developed for Joint Land Use Studies, Navy Encroachment Action Plans, and Marine Corps Encroachment Control Plans.

3.2.2. Range Compatibility Zone-II (RCZ-II)

RCZ-II is the area of armed over flight as defined in accordance with specific range safety policy.

RCZ-II is less restrictive than RCZ-I and supports compatible land use (See appendix A). However, RCZ-II still poses a level of potential safety concern and does come with recommended land use restrictions. Land uses, which have the potential to attract congregations of people, are not recommended with RCZ-II.

3.2.3. Range Compatibility Zone-III (RCZ-III)
RCZ-III defines the area within the designated Special Use Airspace (SUA)associated with the Range outside of the areas designated as RCZ I and RCZ II that is required to provide access to and from the range, permit tactical

maneuvering, and safely separate participating and non-participating aircraft. While RCZ-III correlates to required airspace, it is the land use underlying the airspace that is considered for safety reasons.

3.2.4. Disclosure Zones

It is important that potential buyers, renters or lessees be notified of possible noise and safety issues associated with range operations. This disclosure is strongly encouraged in the noise zones greater than 60 DNL (or 60 CNEL) and Range Compatibility Zones, and encouraged within the general vicinity of the air-to-ground range where air operations may result in public annoyance.

3.3. COMPATIBLE LAND USE GUIDELINES

RCZ land use compatibility information and general guidance, listed by land use category, is presented in Appendix A for use by local governments in their land use planning and zoning deliberations. Consistency in the application of these land use recommendations at the installation is important. Further amplification is available from "Standard Land Use Coding Manual" U.S. Department of Transportation, Federal Highway Administration, March 1977). Where a specific local land use is not adequately described in the standard guidance document, refinement and interpretation of the basic data is encouraged, within the constraints of accepted land use planning practice and with the approval of CNIC (N5) or CMC (LF).

Where local authorities have adopted specific land use recommendations that are more stringent than the criteria herein provided, the RAICUZ plan may incorporate and support the specific local criteria. However, land use planning recommendations proposed for publication in RAICUZ documents that vary from Appendix A require CNI/CMC approval prior to public dissemination. In all cases, the land use recommendations must consider the allowed aircraft operating altitudes in the corresponding airspace and preclude uses or building or structure heights that would pose a safety hazard to aircraft operations.

3.4. HEIGHT AND OBSTRUCTION CONCERNS

This instruction addresses recommended compatible land use with respect to aircraft noise and potential safety concerns. Land uses in the vicinity of air installations are also subject to aircraft safety clearances, height restrictions and other obstruction concerns. Within the RCZ's, any buildings, towers or other structures taller than 100 feet above ground level (agl) are coordinated with range safety officials to ensure compatibility. Any structures exceeding 199 feet agl should also be coordinated with the FAA per FAA guidelines.

Additionally, the following land uses should be examined for compatibility within the range environs:

3.4.1 Uses that may cause smoke, dust or steam that could obscure pilot and range safety personnel vision;

3.4.2 Direct and indirect lighting that could interfere with pilot vision, including, but not limited to, searchlights, lasers, and fireworks;

3.4.3 Uses that may cause electromagnetic interference (EMI) with aircraft navigation, communication or weapons systems;

3.4.4 Uses that may attract birds, such as landfills, wastewater treatment facilities, dredge disposal sites, seafood processing plants, etc; and

3.4.5 Uses that may affect aircraft radar or low-level training capability such as with the increasing height and dispersal of wind turbine farms.

SECTION IV

4. NOISE EXPOSURE

4.1. GENERAL

In addition to Range Compatibility Zones, the RAICUZ study should consider potential noise impacts in the vicinity of the range. For air-to-ground ranges where adjacent or nearby noise-sensitive land uses exist or the potential for development is present, a detailed noise impact analysis is warranted. Such noise analysis should address aircraft noise, ordnance (blast noise), and supersonic operations, if applicable.

4.2. DEVELOPMENT OF NOISE EXPOSURE CONTOURS

Part of the RAICUZ study includes preparation of a noise plan to develop noise exposure contours and compare them to prior noise contours published in the last approved RAICUZ document. The noise contours are developed by a computerized simulation of aircraft activity at the range and reflect site-specific conditions (e.g., terrain) and operational data (e.g., flight tracks, type and mix of aircraft, aircraft profiles (airspeed, altitude, power settings)), and number/types of weapons employed as well as the frequency and times of operations. RAICUZ program experience indicates that future year planning is necessary to consider the effects of expected changes in mission, aircraft, and range operational levels, etc. Therefore, in addition to the current year analysis of operations, RAICUZ 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 range 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 and ordnance 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 activity shall

recommend the most appropriate noise footprints for approval by CNO/CMC.

4.2.1. General

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 range does not adequately represent the noise impacts at that range, the Average Busy Day (ABD) can be used with supporting rationale (i.e., there are times when a detachment uses the range creating several days of higher noise impact). Range Managers are encouraged to contact CNI (N531)/ CMC (LF) for further guidance.

The operations level on an AAD is calculated by dividing the total annual range operations by 365 days. An ABD occurs when the range operations levels on a given day are at least 50 percent of the Average Annual Day 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.

4.2.2. Noise Zones and Noise Models

4.2.2.1 Day-Night Average Sound Level (DNL) shall be used in all RAICUZ Studies except at California ranges, which will use Community Noise Equivalent Level (CNEL). Where applicable, noise contours 60, 65, 70, 75, and 80 shall be plotted on maps for Navy and Marine Corps ranges as part of RAICUZ studies. Contours below 60 DNL/CNEL 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/CNEL 60.

4.2.2.2. The NOISEMAP program or MR_NMAP may 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.

4.2.2.3 For ranges with a fixed run-in heading, NOISEMAP will be utilized.

4.2.2.4 For ranges with variable run-in headings, the MOA and Range Noise Map program (MR_NMAP) will be utilized.

4.2.2.5. For low-level military training routes (MTR) to and from the range, MR_NMAP will be utilized.

4.2.2.6. Noise from ordnance delivery (blast noise) is impulsive in nature and of short duration. Blast noise is often a source of discomfort for persons, and vibrations of buildings and structures included by blast noise may result in increased annoyance. Where noise sensitive uses are located in the vicinity of a range, blast noise contours will be developed using the latest version of the Department of Defense BNOISE program.

4.2.2.7. The use of the C-weighted average sound level (CDNL) is an appropriate noise metric to represent the effects of blast noise from both air-to-ground ranges using live ordnance and Marine Corps ground training ranges. Initial BNOISE analysis input data should be coordinated with the Noise Staff of the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM). Blast noise C-weighted contours of 57, 62, 70, 75 and 80 CDNL should be included.

4.2.2.8. Supplemental metrics can also help explain special situations (e.g., noise at a school during school hours; noise at certain peak periods of the year when a major exercise is conducted, etc.). Single event noise data (e.g., SELs at various distances during a single aircraft over flight; peak PK15 (events), etc.) may be employed where appropriate to provide additional information on the effects of noise in certain situations.

4.2.3. Selection of Final Noise Contours to be used in the RAICUZ Plan

The selection criteria and rationale for the noise contours (e.g., current year or prospective used to reflect aircraft noise and blast noise must be documented in the request for

approval of the RAICUZ plan) shall be made by the installation, concurred with by the chain of command, and approved by CNO (N5) or CMC (LF).

4.3. COMPATIBLE LAND USE GUIDELINES FOR NOISE ZONES

For land use planning purposes, the noise exposure from aircraft is divided into three noise zones: Noise Zone 1 (DNL/CNEL less than 65) is an area of lesser impact where sound attenuation is not normally recommended; Noise Zone 2 (DNL/CNEL 65-74) is an area of moderate impact where some land use controls for noise-sensitive uses are desired; and Noise Zone 3 (DNL/CNEL 75 and above) is the area of highest potential noise impact and requires the greatest degree of compatible land use control. In addition to the noise zones, areas of concern may be defined where noise levels are not considered to be objectionable (less than 65 DNL/CNEL,), but some degree of land use controls are recommended (e.g., areas under ingress and egress routes to and from training ranges). Appendix B provides compatibility guidelines for noise zones.

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 prior coordination with CNO(N53)or CMC(LF).

SECTION V

5. THE RANGE AIR INSTALLATIONS COMPATIBLE USE ZONES (RAICUZ) PLAN

5.1. PLAN CONTENT

The RAICUZ study or RAICUZ study update can be prepared by the RAICUZ project manager with assistance from the area COE or by a contractor. The plan should include the following Sections and content:

5.1.1. Executive Summary

A concise summary of the findings, conclusions, and recommendations of the RAICUZ study will be included in the Executive Summary. This section will also include a brief discussion of any extenuating or mitigating requirements necessary for safe range operations.

5.1.2. Introduction

The Introduction includes a discussion of the RAICUZ program and provides the plan user with a familiarity of the operational aspects of the range. In particular, information relating to the RAICUZ program will include a general description of the purpose, scope, authority, objectives, program history, and roles and responsibilities for implementing the RAICUZ Program. Range specific information will include the mission that this range fulfills and how its role supports Fleet or Joint Service air-to-ground weapons delivery training or testing, a description of applicable NEPA documentation, a list of any assumptions that were utilized, software(s) and versions utilized to complete RCZ modeling, and changes in operations, aircraft or weapons that have or are proposed to occur that necessitate an update of the previous RAICUZ plan.

5.1.3. Range and Airspace Overview

This section includes a discussion and appropriate figures to depict the location of the range, associated special use airspace, military training routes, other local features of

concern that may affect range utilization such as nearby airfields, towers, or other man-made or natural features that may be of concern. Also include a description of the range itself, including features of importance, impact areas, targets, restrictions, types and numbers of annual, current, and future operations, users of the range, normal days and times of operations, range utilization, etc. Other pertinent information that may add value to the overall analysis and land planning should be included as well. This may include information relating to locations of past aircraft mishaps, locations of off-site ordnance drops, history of the area (especially if range boundaries have changed over time), use of lasers and footprints or safety considerations that they introduce, etc.

All airspace maters shall be coordinated through the appropriate Regional Airspace Coordinator (RAC) in accordance with reference (i).

5.1.4. Range Compatibility Zones (RCZs)

This section introduces what RCZs are and how they are developed. For updates to an existing RAICUZ study, this section should include a comparison of the new RCZs to the RCZs presented in the previous approved RAICUZ study with a description of the notable differences.

5.1.5. Noise Analysis

This section describes the methodology to develop noise contours and provide the aircraft and ordnance noise contours as appropriate. Contours presented should reflect operations into the future as best available data allows. Inclusion of the long-range prospective noise contours should minimize the requirement to update the plan as often. This is important as most state or local planning offices update their plans on long-term intervals and installations should strive to coordinate their planning with these agencies for best results. As necessary, prepare any single event noise analyses and develop the appropriate rationale to incorporate this information into the plan. Discuss alternatives considered to minimize off-site noise impacts if appropriate. Include a discussion of other local factors that may influence noise such as natural geographic conditions, local weather anomalies, or other items and discuss how these may influence range

operations. Provide a discussion of noise complaints that have been received associated with range operations. For updates to an existing RAICUZ plan, this section should include a comparison of new noise contours to contours presented in the previous approved RAICUZ plan with a description of the differences.

5.1.6. Alternative Noise Analysis

Alternatives analysis is normally presented when high noise impacts are outside the range boundary. The alternatives analysis should consider altering flight tracks, run-ins, target placement, operational parameters (altitude, dive angle, airspeed), without compromising flight safety or essential mission requirements in order to examine impacts of high noise.

5.1.7. Land Use Compatibility Analysis

This section must include a map and description of existing land uses in the study area, a discussion of land use compatibility guidelines for the RCZ and noise zones, a discussion of any incompatibilities of existing land uses, identification of local planning authorities and existing measures, tools, or regulations available to control zoning or land use. This section should also discuss the conclusions or recommendations from any existing planning studies, development plans, comprehensive plans, or any similar types of studies or plans that may be applicable.

5.1.8. Land Use Recommendations

This section should provide conclusions and recommendations to implement the RAICUZ program for the range. Recommendations for specific land use changes, zoning, residential disclosure zones and implementation of other strategies should be presented. These recommendations should include specific roles, responsibilities, and expectations for each stakeholder that has a role in implementation of the RAICUZ program.

5.1.9. Appendices

Appendices should include any pertinent information, such as existing land use agreements that do not fit into the

body of the plan, but add valuable information to users of the plan.

5.2. RAICUZ STUDY REVIEW AND APPROVAL

Once the RAICUZ study or update has been prepared, it must be reviewed and approved by CNO/CMC prior to any release of data contained therein outside of DOD and prior to implementation. Information developed, such as noise or RCZ footprints should not be shared with other agencies including local government agencies and planning offices until the new RAICUZ plan has been formally approved by either CNO or CMC, as appropriate. Once prepared, the installation must submit the plan requesting approval from CNO/N46 or CMC (LF) via the chain-of-command. For Navy RAICUZ studies, the plan must be reviewed and endorsed by the appropriate Navy Region, and the appropriate AICUZ/RAICUZ Center of Excellence, prior to CNO/N46 approval. For Marine Corps RAICUZ studies, plans must be endorsed by the appropriate COMMARFOR prior to approval by CMC (LF). Once the plan has been approved by CNO/CMC, a letter acknowledging approval of the plan shall be sent by CNO/CMC to the installation, range and training area command. The letter of approval shall be inserted in the front of the RAICUZ study prior to final printing and dissemination.

5.3. RAICUZ PLAN DISTRIBUTION

After CNO/CMC approval of the RAICUZ study, an appropriate number of copies of the plan should be printed and distributed. In addition, as required by reference (e),information developed in support of the preparation of the plan will be delivered on a CD or DVD including the word document, an Adobe Pdf version of the complete study and GIS geo-referenced data and formatted to meet Tri-Service Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) geo-database and Federal Geographic Data Committee (FGDC) metadata standards. The RCZ and noise footprints along with any land use layers will be incorporated into the activity, NAVFAC, Region, and/or CNI Geographic Information Systems. Because the intent of this plan is to implement a successful RAICUZ program with other Federal, state and local agencies, copies of the plan (printed or electronic) will be distributed to the appropriate agencies for information purposes.

SECTION VI

6. RAICUZ IMPLEMENTATION

6.1. GENERAL

Each Navy and Marine Corps air-to-ground range installation listed in Appendix C shall comply with the RAICUZ program. Program implementation includes developing current and future RCZs and current and prospective noise analysis for the range, partnering with appropriate federal, state, and local government agencies (working with these agencies for compatible land use near and around the ranges), considering operational alternatives as necessary, implementing a complaint response program in the surrounding communities, and developing strategies to protect the long term viability of the range while maintaining a high degree of public safety.

6.2. COMMUNITY IMPLEMENTATION

The Department of the Navy's RAICUZ policy is predicated on promoting compatibility between air-to-ground range installations, neighboring communities, States, other federal agencies, and Native American tribes responsible for land management in the vicinity of Navy and Marine Corps ranges. This policy recognizes the local governments' responsibility to protect public health, safety and welfare through controls like zoning ordinances, building codes, subdivision regulations, building permits, and disclosure statements. Local government implementation of RAICUZ land use recommendations, through their local land use planning and zoning processes, allow areas within and surrounding established RCZs and noise zones to develop as compatible uses. Successful implementation of the RAICUZ program depends on a close working relationship between the range installation and local community.

Pursuit of an acquisition or withdrawal of land near the range may be appropriate if local, regional or state initiatives to prevent incompatible development prove unsuccessful or where alternatives analysis indicates other alternatives are not practicable to prevent encroachment. The activity should on a regular basis inform local governments, state governments, Native American Indian tribes other federal agencies, citizens groups, and the general public on: (a) the requirements of

military aviation; (b) range operations; (c) the efforts underway and planned to reduce potential off range weapons impacts and noise; and (d) the DON's recommendation on specific land use issues.

Range installation representatives, primarily commanders and their range manager or if they have a Community Plans & Liaison Officer (CP&LO), should meet with and make presentations to local governments, particularly the planning and zoning agencies about the RAICUZ plan. To most effectively communicate DON requirements and have open discussions with various agencies, tribes, and community organizations, it is recommended that each installation commander take actions to create a Land Use Planning Partnering Team. Partnering teams should meet on a regular basis to discuss current topics of concern or interest and present information to other team members on foreseeable actions that may be occurring within the affected areas.

Although the emphasis of the RAICUZ implementation effort must be on areas within the RAICUZ footprint (noise zones and RCZs), the range installation can comment on land use issues outside the footprint, which might impact on it (e.g., large scale developments near the RAICUZ footprint), or transportation system or utility corridor developments which could make the RAICUZ area more desirable for development. The range commanding officer should convey to the local land use agencies that the range is a major land use in the local community and merits special consideration and protection. Development which occurs near the RCZs and noise zones could prevent mission changes or expansion in the future. Therefore, commanders through their staffs should monitor proposed development beyond the RCZs and noise zones, and, if needed, to present those concerns in appropriate local forums. CNI, CMC (LF) or COE on the East and West coasts can provide assistance as needed.

6.3. DOCUMENTATION OF LOCAL EFFORTS

Records of important discussions, negotiations, testimony, etc., with and before local officials, boards, etc., should be maintained by the local command for at least seven years. This will ensure that documentation is available to indicate reasonable and prudent efforts were made to preclude incompatible land use through cooperation with local and state government officials and other federal agencies as appropriate, and that recourse to such actions has been exhausted.

SECTION VII

7. REAL PROPERTY GUIDANCE

7.1. ACQUISITION POLICY

When threats to operational integrity from incompatible development (encroachment) are anticipated, and when local communities are unwilling or unable to take the initiative in combating the threat via their own authority, consideration can be given to pursue land acquisition or withdrawal of public lands when appropriate. Documentation of community unwillingness or inability will be required to support acquisition projects. Where the mission of the air-to-ground range is imminently threatened, acquisition of fee title or restrictive easements over the impacted lands in any RCZ or noise zone may be appropriate to maintain operational integrity.

7.2. ENCROACHMENT INDICATORS

The importance of the air-to-ground range having sensitivity to long-range encroachment indicators cannot be overemphasized. Local community capital improvement plans and long-range land-use plans provide clues far in advance of actual encroachment actions. These plans generally address land areas far greater than the RAICUZ and must be evaluated to determine their influence on the RCZs and noise zones either directly or indirectly.

7.3. REAL PROPERTY UTILIZATION SURVEY INTERFACE

Executive Order 12512 calls for continual review of Federal real property holdings and the conduct of surveys in order to determine the level of their utilization. Properties found to be excess to the requirements of the holding agency are reported for disposal. The RAICUZ provides protection to ranges, but increased pressure to excess property can dilute that protection. To avoid the forced disposal of lands required for the protection of the range from encroachment, ranges will ensure that required lands or easements are fully justified. Where disposal is directed, those rights and interests required for the protection of the future operational integrity of the

installation through restrictions to ensure compatible land use will be retained.

Particular attention must be paid to property located outside of RCZ-II - area of armed over flight, which if excessed, would attract uses that would induce incompatible developments within the RAICUZ area (e.g., water, sewer, or highway development). Additionally, the prior history of RAICUZ areas and potential growth should be fully considered. Once property rights are relinquished, they are not easily, if ever, regained. The dynamic nature of Navy and Marine Corps operational needs must be evaluated in encroachment protection decisions.

7.4. GUIDELINES FOR ACQUISITION/RETENTION OF REAL ESTATE WITHIN RAICUZ

This instruction shall not be used as the sole justification for either the acquisition or the retention of owned interests beyond the minimum required to protect the Government. Detailed procedural requirements related to the Navy's real estate program are set forth in NAVFAC P-73 (Real Estate Procedural manual) (NOTAL), or as implemented within the Marine Corps by MCO P11000.14 (NOTAL).

7.5. REAL ESTATE INTERESTS TO BE CONSIDERED FOR RAICUZ

When it is necessary for the Department of the Navy to acquire interests in land, a careful assessment must be made of the type of interest to be acquired either in the form of restricted use easements or in fee simple. In deciding what interest to acquire, the following factors are examined: The minimum interest necessary to protect the DON; when the property is needed; available funds; type of acquisition (e.g., fee v. restrictive easements); and environmental considerations (e.g., contaminated property, NEPA).

Real property interest to be considered for acquisition include but are not limited to; making low and frequent over flights, high aircraft noise, prohibiting light emissions that interfere with pilot vision, prohibiting electromagnetic and radio frequency emissions that interfere with aircraft communication or navigation equipment, control of the height of buildings, structures, towers, trees or other obstructions that interfere with aircraft operations, and access by government representatives, prohibiting entry of non-authorized persons.

7.6. ENCROACHMENT PARTNERING

Encroachment Partnering (EP) is a specific land acquisition authority (10 USC 2684a, as amended) that can be used to reduce or eliminate current encroachment or prevent future restrictions on military operations. The statute authorizes the military departments to execute agreements with public and private partners to acquire real property interests from willing sellers adjacent to or near military installations (including ranges) to; (1) to acquire buffer zones to prevent incompatible land use from impacting military missions, and (2) to preserve off-base habitat to relieve current or avoid future environmental restrictions on operations. This statute authorizes the Military Departments to enter into "encroachment partnering" agreements with states, political subdivisions thereof, and private conservation entities. Private conservators specialize in identifying and acquiring private land for conservation purposes and can respond quicker than the DON to purchase opportunities. Both public and private conservators offer valuable resources to leverage DON's encroachment prevention efforts. The Navy's Encroachment Partnering program is outlined in OPNAVINST 11010.40, Shore Installation Encroachment Management Program, dated 27 March 2007. The Installation Commanders' Guide to Encroachment Partnering dated 10 Feb 2006 provides Marine Corps installation commanders and their staffs with the information they need to help plan and execute successful encroachment partnering projects.

7.7. REAL PROPERTY MANAGEMENT

Regional Commanders/area coordinators Range Installations Commanding Officers and Marine Corps Base and Station Commanding Officers shall be responsible for the administration, use, and management of real property assets as related to the readiness and effectiveness of Department of the Navy ranges. This responsibility is particularly relevant to documentation, oversight, and enforcement of Navy and Marine Corps interests in land outside the installation boundary as encroachment protection, whether that land is acquired in fee, easement, or through local zoning actions.

Installation Commanders shall develop a real property management plan to establish standard operating procedures to maintain Navy and Marine Corps control of acquired property interests. This plan should also include updated base mapping incorporating RAICUZ areas containing land use restrictions.

APPENDIX A

SUGGESTED LAND USE COMPATIBILITY IN RANGE COMPATIBILITY ZONES

LAND USE	RCZ I	RCZ II	RCZ III
RESIDENTIAL - SINGLE FAMILY, DUPLEX, MOBILE HOMES	N	N	Y[3]
RESIDENTIAL - MULTIPLE FAMILY HOMES	N	N	N
TRANSIENT LODGING	N	N	N
SCHOOL CLASSROOMS, LIBRARIES, CHURCHES	N	N	N
HOSPITALS	N	N	N
NURSING HOME	N	N	N
AUDITORIUMS, CONCERT HALLS	N	N	N
OFFICE BUILDINGS - PERSONAL, BUSINESS, PROFESSIONAL	N	N	Y[2]
COMMERCIAL, RETAIL	N	N	Y[2]
MANUFACTURING	N	N	Y[2]
UTILITIES	N	N	Y
PLAYGROUNDS, NEIGHBORHOOD PARKS	N	N	Y[2]
GOLF COURSES, RIDING STABLES, WATER RECREATION, CEMETERIES	N	Y[4]	Y[2]
OUTDOOR SPECTATOR SPORTS	N	N	Y[2]
INDUSTRIAL, WAREHOUSE, SUPPLIES	N	N	Y
LIVESTOCK, FARMING, ANIMAL BREEDING	N	Y[1]	Y[2]
AGRICULTURAL (EXCEPT LIVESTOCK), MINING, FISHING	N	Y[1]	Y
RECREATIONAL, WILDERNESS AREAS	N	Y[2]	Y[2]

NOTES:

1. Range Compatible Use Zone-II is an area of armed overflight. Land uses which have the potential to attract congregations of people are not compatible. For scored targets, no development within 500 feet either side of the run-in line centerline. For tactical targets, further analysis is required. Factors to be considered: labor intensity, structural coverage.
2. Incompatible when the training mission requires low altitude overflight (less than 500 ft).
3. Suggested maximum density in RCZ-III is no more than 1-2 dwelling units per acre.
4. Clubhouses, chapels and other facilities where people congregate are not compatible in RCZ-III.

APPENDIX B

SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES

LAND USE	Noise Zone 1		Noise Zone 2		Noise Zone 3		
	< 55	55-64	65-69	70-74	75-79	80-84	85+
RESIDENTIAL - SINGLE FAMILY, DUPLEX, MOBILE HOMES	Y	Y[1]	N[1]	N[1]	N	N	N
RESIDENTIAL - MULTIPLE FAMILY HOMES	Y	Y[1]	N[1]	N[1]	N	N	N
TRANSIENT LODGING	Y	Y[1]	N[1]	N[1]	N	N	N
SCHOOL CLASSROOMS, LIBRARIES, CHURCHES	Y	Y[1]	25	30	N	N	N
HOSPITALS	Y	Y[1]	25	30	N	N	N
NURSING HOMES	Y	Y	N[1]	N[1]	N	N	N
AUDITORIUMS, CONCERT HALLS	Y	Y[1]	25	30	N	N	N
OFFICE BUILDINGS - PERSONAL, BUSINESS, PROFESSIONAL	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
COMMERCIAL, RETAIL	Y	Y[1]	Y	25	30	N	N
MANUFACTURING	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
UTILITIES	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
PLAYGROUNDS, NEIGHBORHOOD PARKS	Y	Y[1]	Y[1]	Y[1]	N	N	N
GOLFCOURSES, RIDING STABLES, WATER RECREATION, CEMETARIES	Y	Y[1]	Y[1]	25	30	N	N
OUTDOOR SPECTATOR SPORTS	Y	Y[1]	Y[5]	Y[5]	N	N	N
INDUSTRIAL, WAREHOUSE, SUPPLIES	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
LIVESTOCK, FARMING, ANIMAL BREEDING	Y	Y	Y[6]	Y[7]	N	N	N
AGRICULTURAL (EXCEPT LIVESTOCK), MINING, FISHING	Y	Y	Y	Y	Y	Y	Y
RECREATIONAL, WILDERNESS AREAS	Y	Y[1]	Y[1]	Y[1]	N	N	N

NOTES:

Y (Yes) — Land Use and related structure compatible withot restrictions.

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

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

NOTES FOR APPENDIX B - SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES

1.
a) Although local conditions regarding the need for housing may require residential use in these Zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. 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 Noise Level Reduction (NLR) of at least 25 dB in DNL 65-69 and NLR of 30 dB in DNL 70-74 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 75-79.

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 (STC) ratings in windows and doors and closed windows year round. Additional OPNAVINST 11010.36B 19 Dec 2002 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 public is received, office areas, noise sensitive areas or where the normal noise level is low.

4. Measures to achieve NLR of 35 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.

APPENDIX C

NAVY MARINE CORPS RANGES REQUIRING RAICUZ STUDIES

CINCPACFLT

WHIDBEY ISLAND COMPLEX:

R-5701/5706 BOARDMAN

FALLON COMPLEX:

R-4803 B-16

R-4804 B-17

R-4810 B-19

R-4802/R-4813 B-20

BOB STUMP RANGE COMPLEX:

R-2512 INKEY BARLEY/KITTY BAGGAGE

R-2510 SHADE TREE/LOOM LOBBY

CHINA LAKE COMPLEX

R-2524 ELECTRONIC COMBAT RANGE (echo)

NAVAIR

R-4002 BLOODSWORTH ISLAND

CFFC

VIRGINIA CAPES COMPLEX:

R-5313 STUMPY POINT RANGE

R-5314 NAVY DARE COUNTY RANGE

JACKSONVILLE COMPLEX:

R-2906 RODMAN TARGET

R-2907 LAKE GEORGE COMPLEX TARGETS

R-2910 PINECASTLE COMPLEX TARGETS

NETC

R-6312 MCMULLEN COUNTY RANGE

R-4404 NOXUBEE COUNTY RANGE

COMMANDANT MARINE CORPS

MCB TWENTY-NINE PALMS (R-2501)

MCB CAMP PENDLETON (R2503)

MCAS YUMA:
CHOCOLATE MOUNTAINS AERIAL GUNNERY RANGE (R-2507N/S)

BARRY M. GOLDWATER RANGE (R-2301W)

MCB QUANTICO (R-6608)

MCB CAMP LEJEUNE (R-5303, R-5304, R-5306D, R-5306E)

MCAS CHERRY POINT (R-5306A)

MCAS BEAUFORT (TOWNSEND RANGE) (R-3307)