

CHANGE

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

7400.2E CHG 2

SUBJ: FAA ORDER 7400.2, PROCEDURES FOR HANDLING AIRSPACE MATTERS

1. **PURPOSE.** This change transmits revised pages to Order 7400.2, Procedures for Handling Airspace Matters.
2. **DISTRIBUTION.** This change is distributed to select offices in Washington headquarters, regional offices, the FAA Technical Center, the FAA Aeronautical Center, all air traffic field facilities, international aviation field offices, and interested aviation public.
3. **EFFECTIVE DATE.** July 25, 2002.
4. **EXPLANATION OF CHANGES.** This change conveys editorial corrections.
5. **DISPOSITION OF TRANSMITTAL.** Retain this transmittal until superseded by a new basic order.
6. **PAGE CONTROL CHART.** See the Page Control Chart attachment.

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Part 1. GENERAL PROCEDURES FOR AIRSPACE MANAGEMENT

Chapter 1. BASIC

Section 1. INTRODUCTION

1-1-1. PURPOSE

a. This order prescribes policy, criteria, guidelines, and procedures applicable to the Air Traffic Airspace Management Program, ATA; Spectrum Policy and Management, ASR; the Office of Airport Planning and Programming, APP; the Office of Airport Safety and Standards, AAS; Aviation System Standards, AVN; and the Flight Standards Service, AFS.

b. This order also applies to all regional and field organizational elements involved in rulemaking and nonrulemaking actions associated with airspace allocation and utilization, obstruction evaluation, obstruction marking and lighting, airport airspace analysis, and the management of air navigation aids.

c. While this order provides procedures for handling airspace matters, additional procedures and criteria to supplement those contained herein may be set forth in other directives and should be consulted.

1-1-2. DISTRIBUTION

This order is distributed to select offices in Washington headquarters; the Office of Commercial Space Transportation; regional Air Traffic; Airway Facilities; Flight Standards; Airports Divisions; the William J. Hughes Technical Center; the Mike Monroney Aeronautical Center; Aviation System Standards; all field facilities; international aviation field offices; and interested aviation public.

1-1-3. CANCELLATION

a. This order cancels Federal Aviation Administration Order (FAAO) 7400.2D, Procedures for Handling Airspace Matters, dated September 16, 1993.

b. The following Policy Memorandums are also cancelled:

1. 89-001, FCC Marking and Lighting Coordination, dated February 23, 1989;

2. 89-002, Airspace Determinations on Seaplane Bases Under Part 157, dated April 19, 1989;

3. 89-005, Evaluating Aeronautical Effect, dated November 9, 1989;

4. 90-001, Evaluating Aeronautical Effect, dated January 9, 1990; and

5. 90-002, Aeronautical Studies, dated March 21, 1990.

1-1-4. EFFECTIVE DATE

This order is effective on December 7, 2000.

1-1-5. EXPLANATION OF CHANGES

a. This order has been revised to incorporate previously issued Policy Memorandums and has been divided into six parts for ease of use and references. Further, several editorial changes have been made to reflect organizational, policy, and procedural changes.

b. If further information is desired, please direct questions through the appropriate facility/regional office to the headquarters office of primary responsibility.

1-1-6. CHANGE AUTHORITY

The Program Director, Air Traffic Airspace Management, ATA-1, will issue changes to this directive after obtaining concurrence from the affected headquarters offices/services listed in the foreword.

Section 2. AUTHORITY AND ORDER USE

1-2-1. POLICY

The navigable airspace is a limited national resource that Congress has charged the Federal Aviation Administration (FAA) to administer in the public interest as necessary to ensure the safe and efficient use of aircraft. Although the FAA must protect the public's right of freedom of transit through the airspace, full consideration shall be given to all airspace users, to include national defense; commercial and general aviation; and space operations. Accordingly, while a sincere effort shall be made to negotiate equitable solutions to conflicts over the use of the airspace for non-aviation purposes, preservation of the navigable airspace for aviation shall be the primary emphasis.

1-2-2. AUTHORITY AND APPLICABILITY

The authority for the procedures and associated rules and regulations addressed in this order are provided in 49 U.S.C. Subtitle VII, Aviation Programs, Part A - Air Commerce and Safety, and Part B - Airport Development and Noise:

- a. Section 40101, Policy;
- b. Section 40102, Definitions;
- c. Section 40103, Sovereignty and Use of Airspace, and the Public Right of Transit;
- d. Section 40106(a), Deviations From Regulations;
- e. Section 40109, Authority to Exempt;
- f. Section 40113, Administrative;
- g. Section 44501(a), Long Range Plans and Policy Requirements;
- h. Section 44502, General Facilities and Personnel Authority;
- i. Section 44502(c), Military Construction, Rockets, and Missiles;
- j. Section 44718, Structures Interfering with Air Commerce;
- k. Section 44719, Standards for Navigational Aids;
- l. Section 44720, Meteorological Services;
- m. Section 44721, Aeronautical Maps and Charts;

n. Section 46104(e), Designating Employees to Conduct Hearings;

o. Section 46301, Civil Penalties;

p. Section 46308, Interference with Air Navigation;

q. Chapter 471, Airport Development - All of Subchapters I and II; and

r. Chapter 475, Noise - All of Subchapters I and II.

1-2-3. TITLE 14 CODE OF FEDERAL REGULATIONS (CFR) REFERENCES

- a. Part 11, General Rulemaking Procedures.
- b. Part 71, Designation of Class A, Class B, Class C, Class D, and Class E airspace areas; airways; routes; and reporting points.
- c. Part 73, Special Use Airspace.
- d. Part 77, Objects Affecting Navigable Airspace.
- e. Part 91, General Operating and Flight Rules.
- f. Part 93, Special Air Traffic Rules and Airport Traffic Patterns.
- g. Part 95, IFR Altitudes.
- h. Part 97, Standard Instrument Approach Procedures.
- i. Part 101, Moored Balloons, Kites, Rockets and Free Balloons.
- j. Part 152, Airport Aid Program.
- k. Part 157, Notice of Construction, Alteration, Activation, and Deactivation of Airports.
- l. Chapter III, Commercial Space Transportation.
- m. Chapter V, National Aeronautics and Space Administration.

1-2-4. FUNCTIONAL RESPONSIBILITIES

Functional responsibilities of Headquarters and regional organizations referred to in this order are detailed in Order 1100.1, FAA Organization -

Policies and Standards; Order 1100.2, Organization - FAA Headquarters; and Order 1100.5, FAA Organization - Field.

1-2-5. WORD USAGE

The concept of word usage and intended meaning as used in this order is set forth below:

a. "Shall" or a command verb is used when application is mandatory.

b. "Shall not" is used when an action is prohibited.

c. "Should" is used when application is recommended.

d. "May" and "need not" are used when application is optional.

e. "Will" is used only to indicate futurity, never to indicate any degree of requirement for application of a procedure.

f. "Navigable airspace" is airspace at or above the minimum altitudes of flight prescribed by the Code of Federal Regulations, and shall include airspace needed to ensure safety in the takeoff and landing of aircraft. By policy, the term "airspace above minimum altitudes of flight" is interpreted to mean "airspace at or above minimum flight altitudes."

g. "Controlled airspace" is a generic term used to describe Class A, Class B, Class C, Class D, and Class E airspace.

1-2-6. ABBREVIATIONS

As used in this manual, Table 1-2-1 contains abbreviations found in this order and their meanings.

1-2-7. ORDER CHANGES

a. This order will be updated semiannually.

b. The responsibility associated with processing and coordinating revisions to this order is delegated to the Manager, Airspace and Rules Division, ATA-400.

c. Proposed changes or recommended revisions should be submitted directly to ATA-400.

d. When revised, reprinted, or added pages are issued, they will be marked as follows:

1. Each revised or added page will show the change number and effective date of the change.

2. Bold vertical lines in the margin of the text will mark the location of substantive procedural, operational, or policy changes (e.g., when material that affects the performance of duty is added, revised, or deleted).

FAA Order Abbreviations

A/FD	Airport/Facility Directory
AAS	Office of Airport Safety and Standards
AAT	Air Traffic
ADO	Airport District Office
AE	Airport Elevation
AF	Airway Facilities
AFS	Flight Standards Service
AFSS	Automated Flight Service Station
AGC	Office of the Chief Counsel, Rules Docket
AGL	Above Ground Level
ALP	Airport Layout Plan
ANI	National Airspace System Implementation Program
APO	Office of Aviation Policy and Plans
APP	Office of Airport Safety and Standards
ARN	Communications, Navigation, Surveillance, and Infrastructure Directorate
ARP	Airport Reference Point
ARSR	Air Route Surveillance Radar
ARTCC	Air Route Traffic Control Center
ARU	Airborne Radar Unit
ASR	Airport Surveillance Radar
ASR	Spectrum Policy and Management
AST	Office of Commercial Space Transportation
ATA	Air Traffic Airspace Management Program
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
ATCRBS	Air Traffic Control Radar Beacon System
ATCSCC	Air Traffic Control System Command Center
ATCT	Airport Traffic Control Tower
ATD	Air Traffic Division
ATREP	Air Traffic Representative
ATS	Air Traffic Service

AVN	Aviation System Standards
CARF	Central Altitude Reservation Function
CASFO	Civil Aviation Security Field Office
CDRA	Center for Devices and Radiological Health
CFA	Controlled Firing Area
CFZ	Critical Flight Zone
CP	Construction Permit
DF	Directional Finder
DME	Distance Measuring Equipment
DNE	Does Not Exceed
DNH	Determination of No Hazard
DoD	Department of Defense
DOH	Determination of Hazard
DPH	Determination of Presumed Hazard
EBO	Exceeds But Okay
EMI	Electromagnetic Interference
ERP	Effective Radiated Power
FAAO	Federal Aviation Administration Order
FACSFAC	Fleet Area Control and Surveillance Facility
FCC	Federal Communications Commission
FDA	Food and Drug Administration
FL	Flight Level
FPO	Flight Procedures Office
FSDO	Flight Standards District Office
FSS	Flight Service Station
GAO	General Accounting Office
HIL	High Intensity Light
IAP	Instrument Approach Procedures
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing Systems
IR	IFR Military Training Routes
IRAC	Interdepartmental Radio Advisory Committee
J	Joule
L/MF	Low/Medium Frequency
LFZ	Laser Free Zone
LLWG	Local Laser Working Group
LMM	Middle Compass Locators
LOA	Letter of Agreement
LOD	Letter of Determination
LOM	Outer Compass Locators
LSO	Laser Safety Officer
MAJCOM	Major Military Commands
MCA	Minimum Crossing Altitudes
MCP	Minimum Crossing Point
MEA	Minimum En Route Altitude
MHA	Minimum Holding Altitudes
MIA	Minimum IFR Altitudes

MLS	Microwave Landing System
MOA	Military Operations Area
MOCA	Minimum Obstruction Clearance Altitude
MPE	Maximum Permissible Exposure
MRAD	Milliradian
MRU	Military Radar Unit
MSA	Minimum Safe Altitude
MSL	Mean Sea Level
MTR	Military Training Route
MVA	Minimum Vectoring Altitudes
NACO	National Aeronautical Charting Office
NAD	North American Datum
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NAVAID	Navigational Aid
NDB	Nondirectional Radio Beacons
NEPA	National Environmental Policy Act
NFDD	National Flight Data Digest
NFZ	Normal Flight Zone
NHRD	Nominal Hazard Zone Distance
NM	Nautical Miles
NOHD	Nominal Ocular Hazard Distance
NOTAM	Notices to Airmen
NPIAS	National Plan for Integrated Airport System
NPRM	Notice of Proposed Rulemaking
NR	Non-Rulemaking
NRA	Non-Rulemaking Airport
NWS	National Weather Service
OE	Obstruction Evaluation
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PFC	Passenger Facility Charge
PL	Public Law
PSR	Project Status Request
RBS	Radar Bomb Sites
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RVR	Runway Visual Range
RVV	Runway Visibility Value
SAMS	Special Use Airspace Management System
SFZ	Sensitive Flight Zone
SIAP	Standard Instrument Approach Procedure
SMO	System Maintenance and Operations
SR	Scientific/Research Lasers
STAR	Standard Terminal Arrival Routes

SUA	Special Use Airspace
TERABA	Termination/Abandoned Letter
TEREXP	Termination/Expired Letter
TERPS	United States Standard for Terminal Instrument Procedures
TERPSR	Termination Project Status Letter
TOFA	Taxiway Object Free Area
UTC	Coordinated Universal Time
VASI	Visual Approach Slope Indicator

VFR	Visual Flight Rule
VGSI	Visual Glide Scope Indicator
VOR	Very High Frequency Omnidirectional Range
VORTAC	Very High Frequency Omni-Directional Radio Range and Tactical Air Navigation Aid
VR	VFR Military Training Route

TBL 1-2-1

Section 5. PROCESSING RULEMAKING AIRSPACE ACTIONS

2-5-1. PURPOSE

This section prescribes procedures to be followed when taking rulemaking actions to establish, modify, or revoke regulatory airspace.

2-5-2. RESPONSIBILITY

a. The Airspace and Rules Division, ATA-400, is responsible for processing the following actions: Class A, B, and C airspace areas; special use airspace; offshore airspace areas; airways; jet routes; and those Class D and E airspace areas that overlie U.S. territories and possessions.

b. The Operations and Air Traffic Law Branch, AGC-220, is responsible for ensuring that the airspace cases listed in paragraph a. meet the requirements of the Administrative Procedures Act.

c. Regional Air Traffic Divisions (ATD) are responsible for processing all Class D and E airspace area cases.

d. The Assistant Chief Counsel for each region is responsible for ensuring that all regional airspace cases meet the requirements of the Administrative Procedures Act.

2-5-3. DOCKETS

a. Docket Location.

1. The official docket for Headquarters' rulemaking cases shall be maintained at the Federal Aviation Administration, Office of the Chief Counsel, Rules Docket, AGC-200, 800 Independence Avenue, SW, Washington, DC 20591.

2. The official docket for regional airspace rulemaking cases shall be maintained in the appropriate regional office.

b. Docket Identification.

1. Rulemaking cases shall be identified by a docket number that includes the last two digits of the calendar year, the abbreviation of the originating office, and a consecutively assigned number (e.g., 00-ASW-46).

2. Numbers shall run consecutively within each calendar year.

c. Docket Content. The official docket shall include all petitions, notices, rules, comments, correspondence, and related material concerning the case (other than working files).

2-5-4. FLIGHT PROCEDURAL DATA

a. If an airspace docket requires a procedure change and/or flight inspection, regional ATD shall coordinate the proposed effective date with the regional Flight Procedures Office (FPO). The proposed effective date must consider the time needed to process procedural changes and allow ample time for flight inspection, if required. The FPO shall notify the regional ATD of any problems that could affect the proposed effective date. See Order 8260.26, Establishment and Scheduling Standard Instrument Procedure Effective Dates, for scheduled processing and publication dates.

b. If a rule without notice is to be issued and flight check data is required, the regional ATD shall inform the responsible regional FPO of the action and specific data requested.

2-5-5. SUBMISSION OF AIRSPACE CASES TO HEADQUARTERS

a. The regional ATD shall review the action proposed and submit a complete technical description of the proposed airspace package (e.g., establishment, modification, or revocation) to ATA-400.

b. All background information including charts, proper justification and appropriate recommendations shall be submitted.

c. If an airspace action needs to be completed by a specific date, the regional ATD shall coordinate with the FPO and any other FAA offices as necessary to ensure that sufficient lead-time exists for meeting normal airspace procedural processing and charting requirements, and instrument approach procedure development.

d. The ATD shall submit to ATA-400 written comments received in response to the proposed action, analysis of the comment(s), and any recommendations within 30 days after the

comment closing date. If applicable, a statement concerning the status of the flight procedures data for en route cases (e.g., Minimum En Route Altitude, MEA; or Change Over Point, COP) shall be included.

2-5-6. EFFECTIVE DATE OF FINAL RULES

a. Amendments to parts 71 and 73 shall be made effective at 0901 Coordinated Universal Time (UTC) and shall coincide with en route charting dates as furnished by ATA-400. Exceptions are as follows:

1. Safety or national interest actions that require an earlier effective time or date.
2. Editorial changes.
3. 700-foot floor Class E airspace areas that underlie existing 1,200-foot Class E airspace areas.
4. Actions that lessen the burden on the public (e.g., revocation of restricted areas).

5. Class B and C airspace areas shall be made effective on days that coincide with the appropriate sectional aeronautical charting dates.

b. Cutoff dates are established to allow sufficient time for charting and chart distribution purposes. Rules should be signed on or before the applicable cutoff date.

2-5-7. PUBLICATION IN FEDERAL REGISTER

An original Notice of Proposed Rulemaking (NPRM) and three copies, or an original final rule and seven copies shall be forwarded to AGC-200 for publication in the Federal Register.

2-5-8. DISTRIBUTION

Distribution of airspace dockets (NPRMs and final rules) shall be consistent with the procedures set forth in Order 1720.18, FAA Distribution System.

Part 2. OBJECTS AFFECTING NAVIGABLE AIRSPACE

Chapter 5. BASIC

Section 1. GENERAL

5-1-1. PURPOSE

The guidelines, procedures, and criteria detailed in this part supplement those contained in part 77, Objects Affecting Navigable Airspace, and address the following:

- a. The performance of functions relating to the processing of notices of proposed construction or alteration;
- b. The conduct of aeronautical studies of any existing or proposed object affecting the navigable airspace;
- c. The conduct of aeronautical studies of the electromagnetic radiation effect of proposed or existing objects on the operation of air navigation facilities;
- d. The conduct of aeronautical studies of the physical effect of proposed or existing objects on the line-of-sight view of all runways, taxiways, and traffic pattern areas from the airport traffic control tower; and
- e. The conduct of aeronautical studies regarding the physical effect of proposed or existing objects on airport approach lighting systems.

5-1-2. AUTHORITY

a. The FAA's authority to promote the safe and efficient use of the navigable airspace, whether concerning existing or proposed structures, is predominantly derived from Section 44718. It should be noted however, that Section 44718 does not provide specific authority for the FAA to regulate or control how land (real property) may be used in regard to structures that may penetrate navigable airspace.

b. Title 14 of the Code of Federal Regulations part 77, Objects Affecting Navigable Airspace, was adopted to establish notice standards for proposed construction or alteration that would protect aircraft from encountering unexpected structures.

5-1-3. POLICY

The prime objective of the FAA in administering 49 U.S.C. 44718 and 14 CFR part 77 in conducting obstruction evaluation studies is to ensure the safety of air navigation and efficient utilization of navigable airspace by aircraft.

5-1-4. SCOPE

a. 49 U.S.C. Sections 40103 and 44718, and part 77 apply only to structures located within any state, territory, or possession of the United States, within the District of Columbia, or within territorial waters (12 NM) surrounding such states, territories, or possessions.

b. Structures that are subject to study requirements associated with 49 U.S.C. Section 40103, 44718, and part 77 may be man made (including mobile structures) or of natural growth and terrain whether existing, proposed, permanent, or temporary.

5-1-5. RESPONSIBILITY

The responsibility for managing the obstruction evaluation program for those structures that may affect the navigable airspace is delegated to the regional ATD.

5-1-6. SENSITIVE CASES REFERRED TO WASHINGTON

a. The regional ATD Manager may refer sensitive cases (with their recommendation) to ATA-400 before issuing, revising, or extending a determination concerning a construction proposal that precipitates a policy determination.

b. When a regional ATD Manager refers a sensitive case, ATA-400 shall:

1. Review, analyze, and evaluate the construction proposal, the aeronautical study, and the region's recommendation with the coordinated assistance of ASR-100, AAS-100,

AFS-420, and AVN-100. Additionally, ASR-100 shall review all obstruction evaluation cases for potential electromagnetic interference. AGC-230 shall review each case for form and legality as determined necessary by ATA-400.

2. Prepare and coordinate a memorandum for ATA-1's signature to the regional ATD Manager concurring or non-concurring with the region's recommendation. The regional ATD will then issue the appropriate determination.

5-1-7. PERIODIC REVIEW

ATA-400 shall conduct special and periodic reviews of regional aeronautical studies, processing procedures, and issued correspondence to ensure agency-wide continuity in the execution of the obstruction evaluation program. ASR-100, AAS-100, AFS-420, and AVN-100 shall assist in these reviews as requested.

5-1-8. AUTOMATION

a. To the extent practicable, the obstruction evaluation/airport airspace analysis (OE/AAA) automated programs shall be used in lieu of manual processing.

b. Automated obstruction evaluation (OE) correspondence forms shall be used.

5-1-9. OE/AAA AUTOMATED SYSTEM AIRPORT/RUNWAY DATABASE

a. To ensure the automated part 77 obstruction criteria and the military part 77 obstruction criteria conflict analysis programs consider all known plans on file, the regional Airports Division is responsible for maintaining the automated airport/runway database.

1. Either the Airports Division or the Airports District Office shall enter the ultimate airport reference point for any proposed public-use or military airport into the database within two working days from receipt of the information.

2. Either the Airports Division or the Airports District Office shall enter any change of airport status from private-use to public-use into the database within two working days from receipt of the information. As workload permits,

information on private-use airports shall also be entered into the database.

NOTE-

Runway information for private-use airports may be omitted.

3. Either the Airports Division or the Airports District Office shall enter all other public-use and military airport/runway information in the database within 10 working days from receipt of the information.

b. Airports shall resolve and correct any discrepancies that have been identified in the automated airport/runway database.

c. Any required corrections shall be forwarded to ATA-100.

5-1-10. TRAINING

Employees involved with the OE/AAA program shall attend the Basic Obstruction Evaluation and Airport/Airspace Analysis Course offered by the FAA Academy.

5-1-11. PERIODIC MEETINGS

To provide a forum to discuss regional OE/AAA issues, each region should conduct periodic meetings for all personnel involved in processing OE/AAA cases.

5-1-12. RELEASE OF INFORMATION

Requests from the public for access to or copies of information contained in obstruction evaluation study files are occasionally made to the regional offices. Such requests shall be processed in accordance with the provisions of the Freedom of Information Act (5 U.S.C. 552), as implemented by part 7 of the Department of Transportation Regulations and Order 1200.23, Public Availability of Information. Information should not be released on any case until a final determination has been made.

Section 2. NOTICES

5-2-1. REQUIREMENTS

a. Requirements for notifying the FAA of proposed construction or alteration are contained in Sections 77.13 (see FIG 5-2-1, FIG 5-2-2, FIG 5-2-3, and FIG 5-2-4) and 77.15. Advisory Circular 70/7460-2, Proposed Construction of Objects that May Affect the Navigable Airspace, provides the public guidance on the application of these notice requirements.

b. No notice is required, as specified in Section 77.15(c), for certain equipment installations "of a type approved by the Administrator" when the equipment is installed in accordance with the established FAA siting criteria. Equipment installed in compliance with the siting criteria without waivers and which does not affect other runways, does not have to be considered under part 77 criteria.

c. Examples of equipment not requiring notice are:

1. Wind equipment (except supplemental wind cones);
2. Transmissometers (Runway Visibility Value (RVV) and Runway Visual Range (RVR) equipment);
3. Instrument Landing Systems (ILS); and
4. Visual Glide Slope Indicators (VGSI).

5-2-2. PROCESSING

a. Air Traffic personnel shall administer obstruction evaluation studies with the

coordinated assistance of Airports, Airway Facilities, Frequency Management, Flight Standards, FPO, and military representatives.

b. The regional ATD shall process notices received under the provisions of Sections 44718 and part 77 as OE cases. The exception to this is notices received under those provisions that pertain to structures located on a public-use airport which shall be processed by the Airports Division as a nonrulemaking airport (NRA) case (defined in Part 3, Airport Airspace Analysis, of this order). However, if the notice pertains to a temporary structure or a structure that radiates a frequency, the Airports Division may request that Air Traffic process the notice as an OE case.

c. If notice is required by any other FAA regulation, the appropriate division shall process the notice under that regulation.

5-2-3. FAA FORMS

Standard FAA forms are established for use in conducting obstruction evaluation studies. The standard FAA forms are:

a. FAA FORM 7460-1, Notice of Proposed Construction or Alteration (OE notice).

b. FAA FORM 7460-2, Notice of Actual Construction or Alteration (Supplemental Notice).

c. FAA FORM 7460-6, Obstruction Evaluation Worksheet.

NOTICE OF CONSTRUCTION OR ALTERATION

§77.13(a)(1) - A notice is required for any proposed construction or alteration that would be more than 200 feet in height above the ground level at its site.

§77.13(a)(1) - Notice Requirement Anywhere

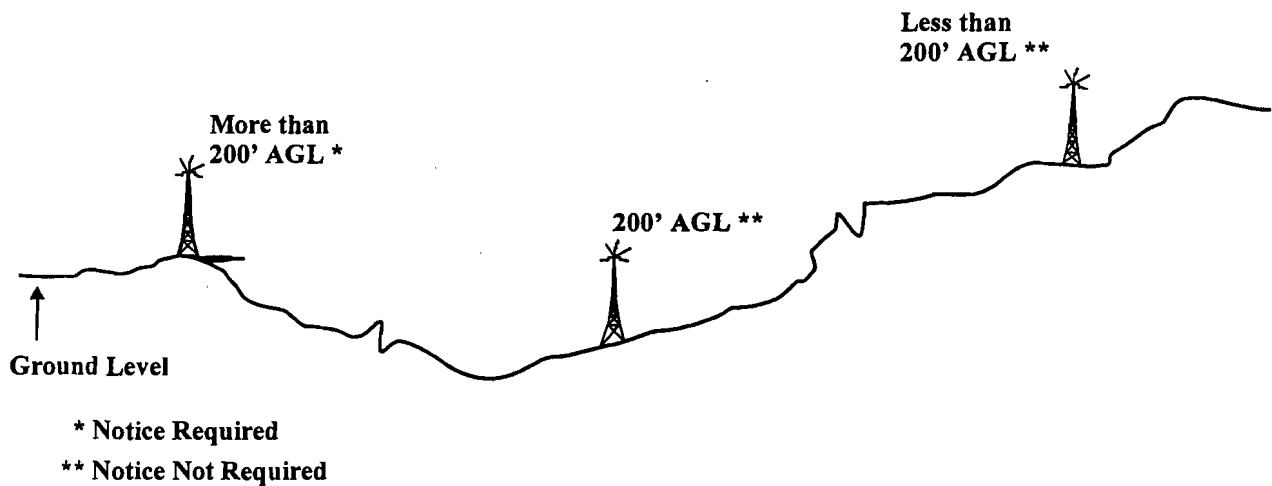


FIG 5-2-1

Section 2. INITIAL PROCESSING/VERIFICATION

6-2-1. INITIAL REVIEW

a. Prior to assigning an aeronautical study number, review the submission for completeness. The following information should be considered:

1. Ground elevation of the site (site elevation);
2. Above ground elevation of the structure (AGL);
3. Latitude and longitude of the structure; and
4. A 7.5-Minute U.S.G.S. Topographic Map (Quadrangle Chart) depicting the site of the structure.

b. If the submission package contains all of the required information, assign an aeronautical study number, enter the data into the OE/AAA automation program, and initiate an obstruction evaluation study. Exceptions may be made for emergency situations in accordance with 77.17(d).

c. If the submission package does not contain the required information, it may be returned to the sponsor with a clear explanation and a request for the sponsor to provide the information necessary to initiate the study.

d. For submission packages pertaining to structures that may be time critical, an effort should be made to obtain the required information by telephone. Information received by telephone conversation should be recorded in a written memo to the file. Also, request the sponsor to provide the same information in writing.

6-2-2. VERIFICATION

a. The regional ATD shall verify each obstruction evaluation case to ensure that the submitted site elevation and coordinates appear to be correct and that all necessary information has been included. Verification shall include, as a minimum, the following actions:

1. Compare the submitted site depiction to the submitted coordinates when plotted;

2. Compare the submitted site elevation to the ground contour elevations in the area of the submitted coordinates when plotted;

3. If a survey is submitted, compare the information contained on the survey, with the submitted information and the site as plotted;

4. If the submission involves an existing structure, compare the submitted information to the digital obstacle file, with the previous aeronautical study (if any), and possibly the FCC tower registration information;

5. Ensure that the submission provides a complete description and clearly explains the reason for submission. The submission should include sufficient information to allow each division to accomplish its specialized portion of the obstruction evaluation;

6. If the submission involves a structure that would normally radiate frequencies, ensure that the frequencies and effective radiated power are included;

7. If the submission involves a structure over 200 feet AGL, ensure marking and/or lighting preferences are part of the submission. Sponsors shall be required to specifically request the type of marking and/or lighting they desire when submitting FAA Form 7460-1. They should be encouraged to become familiar with the different type of lighting systems available. The sponsor should obtain information about these systems from the manufacturers. The sponsor can then determine which system best meets his/her needs based on purchase, installation, and maintenance costs. The FAA will consider the sponsor's desired marking and/or lighting system when conducting the aeronautical study.

b. If the submission contains errors, discrepancies, or lacks information, Air Traffic shall request (automated letter "ADD") resolution by the sponsor and/or the sponsor's representative. If the sponsor does not resolve the issues within 37 days of the written request, Air Traffic may terminate the aeronautical study (automated letter "TERADD").

c. If the submission passes verification and there are no unresolved issues, send a receipt letter (automated letter "REC") to the sponsor and initiate evaluation by other divisions by changing the status in the OE/AAA automation program to "WRK."

NOTE-

It is imperative that all data in the automated OE case file is reviewed and verified for accuracy before proceeding to "Division Coordination." Any correction or change to the heights and/or coordinates after the divisions begin evaluation shall require initiating a new aeronautical study.

6-2-3. DIVISION COORDINATION

Each division described in paragraph 5-2-2 shall evaluate all notices of proposed construction or alteration received regardless of whether notice was required under part 77, except as follows:

NOTE-

For the purpose of division coordination, Frequency Management will be considered separately in addition to Airway Facilities (AF). It should also be noted that Frequency Management responds separately.

a. Side Mounted Non-Microwave Antennas - Airports, Flight Standards, Airway Facilities and the military normally are not required to review OE cases that involve the addition of antennas to a previously studied structure that does not increase in overall height of the structure. Frequency Management will continue to evaluate these cases. The FAA must have previously studied the structure and the data of the present case and it must exactly match the data of the previously studied case.

b. Side Mounted Microwave Dishes - Airports, Flight Standards, and the military normally shall not be required to review OE cases that involve the addition of microwave dishes to a structure that does not increase in overall height. Frequency Management will continue to evaluate these cases. The FAA must have previously studied the structure and the data of the present case and it must exactly match the data of the previously studied case.

c. Marking and Lighting Changes - Airports, Flight Standards, Flight Procedures, Frequency

Management, Airway Facilities, and the military normally are not required to review OE cases which involve only marking and lighting changes. The FAA must have previously studied the structure and the data of the present case and it must exactly match the data of the prior case.

d. Temporary Structures - Airports, Flight Standards, Frequency Management, and the military normally shall not be required to review OE cases which involve temporary structures of a six month or less duration. All appropriate divisions shall review temporary structures of a longer duration.

e. Flight Procedures normally shall not be required to review OE cases that are beyond 14 nautical miles from the airport reference point of the nearest public-use or military airport and the height of the structure is not more than 200 feet above ground level.

f. Airports normally shall not be required to review OE cases that are beyond three nautical miles from the airport reference point of the nearest public-use or military airport.

g. Flight Standards shall review OE cases that are circularized for public comment.

h. Frequency Management normally shall only be required to review OE cases that involve transmitting frequencies.

6-2-4. ADDITIONAL COORDINATION

Air Traffic may request any division to review an OE case on a case-by-case basis. For instance, Flight Standards may be requested to review a marking and lighting change, the military may be requested to review a temporary structure if the closest airport is a military base, or Frequency Management may be requested to review a temporary structure if it radiates a frequency.

Section 3. IDENTIFYING/EVALUATING AERONAUTICAL EFFECT

6-3-1. POLICY

a. The prime objective of the FAA in conducting OE studies is to ensure the safety of air navigation, and the efficient utilization of navigable airspace by aircraft. There are varied demands being placed on the use of the navigable airspace. However, when conflicts arise concerning a structure being studied, the FAA emphasizes the need for conserving the navigable airspace for aircraft; preserving the integrity of the national airspace system; and protecting air navigation facilities from either electromagnetic or physical encroachments that would preclude normal operation.

b. In the case of such a conflicting demand for the airspace by a proposed construction or alteration, the first consideration should be given to altering the proposal.

c. In the case of an existing structure, first consideration should be given to adjusting the aviation procedures to accommodate the structure. This does not preclude issuing a "Determination Of Hazard To Air Navigation" on an existing structure, when the needed adjustment of aviation procedures could not be accomplished without a substantial adverse effect on aeronautical operations. In all cases, consideration should be given to all known plans on file received by the end of the public comment period or before issuance of a determination if the case was not circularized.

6-3-2. SCOPE

Part 77 establishes standards for determining obstructions to air navigation. A structure that exceeds one or more of these standards is presumed to be a hazard to air navigation unless the obstruction evaluation study determines otherwise. An obstruction evaluation study shall identify:

a. The effect the proposal would have:

1. On existing and proposed public-use and military airports and/or aeronautical facilities.

2. On existing and proposed visual flight rule (VFR)/instrument flight rule (IFR) aeronautical departures; arrival and en route operations; procedures; and minimum flight altitudes.

3. Regarding physical, electromagnetic, or line-of-sight interference on existing or proposed air navigation, communication, radar, and control systems facilities.

4. On airport capacity, as well as the cumulative impact resulting from the structure when combined with the impact of other existing or proposed structures.

b. Whether marking and/or lighting is necessary.

6-3-3. DETERMINING ADVERSE EFFECT

A structure is considered to have an adverse aeronautical effect if it first exceeds the obstruction standards of part 77, and/or is found to have a physical or electromagnetic radiation effect on the operation of air navigation facilities. A proposed or existing structure, if not amended, altered, or removed, has an adverse effect if it would:

a. Require a change to an existing or planned IFR minimum flight altitude, a published or special instrument procedure, or an IFR departure procedure for a public-use airport.

b. Require a VFR operation, to change its regular flight course or altitude. This does not apply to VFR military training route (VR) operations conducted under part 137, or operations conducted under a waiver or exemption to the CFR.

c. Restrict the clear view of runways, helipads, taxiways, or traffic patterns from the airport traffic control tower cab.

d. Derogate airport capacity/efficiency.

e. Affect future VFR and/or IFR operations as indicated by plans on file.

f. Affect the usable length of an existing or planned runway.

6-3-4. DETERMINING SIGNIFICANT VOLUME OF ACTIVITY

The type of activity must be considered in reaching a decision on the question of what volume of aeronautical activity is "significant." For example, if one or more aeronautical operations per day would be affected, this would indicate regular and continuing activity, thus a significant volume, no matter what the type of operation. However, an affected instrument procedure or minimum altitude may need to be used only an average of once a week to be considered significant if the procedure is one which serves as the primary procedure under certain conditions.

6-3-5. SUBSTANTIAL ADVERSE EFFECT

A proposed structure would have, or an existing structure has, a substantial adverse effect if it causes electromagnetic interference to the operation of an air navigation facility or the signal used by aircraft, or if there is a combination of:

- a. Adverse effect as described in paragraph 6-3-3; and
- b. A significant volume of aeronautical operations would be affected, as described in paragraph 6-3-4.

6-3-6. RESPONSIBILITY

The FAA's obstruction evaluation program transcends organizational lines. In order to determine the effect of the structure within the required notice period, each office should forward the results of its evaluation within 15 working days to the regional ATD for further processing. Areas of responsibility are delegated as follows:

a. Regional ATD personnel shall:

1. Identify when the structure exceeds Section 77.23 (a)(1) (see FIG 6-3-1 thru FIG 6-3-8) and apply Section 77.23(b) (see FIG 5-2-4).
2. Identify the effect on existing and planned aeronautical operations, air traffic control procedures, and airport traffic patterns;

and make recommendations for mitigating adverse effect including marking and lighting recommendations.

3. Identify when the structure would adversely effect published helicopter route operations, as specified in paragraph 6-3-8 subparagraph e., of this order, and forward the case to Flight Standards.

4. Identify whether obstruction marking/lighting is necessary and recommend the appropriate marking and/or lighting.

5. Identify when negotiations are necessary, and conduct negotiations with the sponsor. This may be done in conjunction with assistance from other division personnel when their subject expertise is required (e.g., in cases of electromagnetic interference).

6. Identify when circularization is necessary and conduct the required circularization process.

7. Evaluate all valid aeronautical comments received as a result of the circularization, and those received as a result of the division evaluation.

8. Issue the determination (except as noted in paragraph 7-1-2, subparagraph b).

b. Regional Airports Division personnel shall:

1. Verify that the airport/runway database has been reviewed, is correct, and contains all plans on file pertaining to the OE case.

2. Identify the structure's effect on existing and planned airports, or improvements to airports concerning airport design criteria including potential restrictions/impacts on airport operations; capacity; efficiency and development; and recommendations for eliminating adverse effect. Airports Divisions are not required to perform evaluations on OE cases that are further than 3 NM from the Airport Reference Point (ARP) of a public-use or military airport.

3. Determine the effect on the efficient use of airports and the safety of persons and property on the ground. Airports will resist structures and activities that conflict with an airport's planning, design, and/or recommendations from other divisions.

c. FPO personnel shall:

1. Identify when the structure exceeds Sections 77.23(a)(3), and 77.23(a)(4).

2. Identify the effect upon terminal area IFR operations, including transitions; radar vectoring; holding; instrument departure procedures; any segment of a standard instrument approach procedure (SIAP), including proposed instrument procedures and departure areas; and making recommendations for eliminating adverse effect.

3. Identify the effect on minimum en route altitudes (MEA); minimum obstruction clearance altitudes (MOCA); minimum vectoring altitudes (MVA); minimum IFR altitudes (MIA); minimum safe altitudes (MSA); minimum crossing altitudes (MCA); minimum holding altitudes (MHA); turning areas and termination areas; and making recommendations for eliminating adverse effect.

4. Coordinate with Air Traffic and Airway Facilities personnel to determine the effect of any interference with an air navigation facility on any terminal or en route procedure.

5. State what adjustments can be made to the procedure/structure to mitigate or eliminate any adverse effects of the structure on an instrument flight procedure.

d. Regional Flight Standards personnel shall identify the effect on fixed-wing and helicopter VFR routes, terminal operations, and other concentrations of VFR traffic. When requested by Air Traffic, the Flight Standards Division shall also evaluate the mitigation of adverse

effect on VFR operations for marking and/or lighting of structures.

e. Airway Facilities personnel shall identify any electromagnetic and/or physical effect on air navigation and communications facilities including:

1. The presence of any electromagnetic effect in the frequency protected service volume of the facilities shown in FIG 6-3-18, FIG 6-3-19, and FIG 6-3-20.

2. The effect on the availability or quality of navigational or communications signals to or from aircraft including lighting systems (e.g., VGSI), and making recommendations to eliminate adverse effect.

3. The effect on ground-based communications and NAVAID equipment, and the signal paths between ground-based and airborne equipment, and making recommendations to eliminate adverse effect.

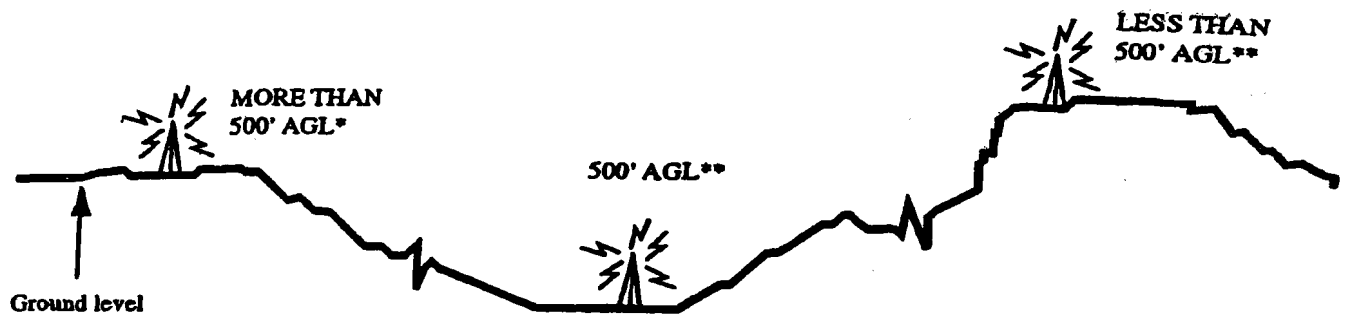
4. The effect on the availability or quality of ground-based primary and secondary radar; direction finders; and air traffic control tower line-of-sight visibility; and making recommendations to eliminate adverse effect.

5. The effect of sunlight or artificial light reflections, and making recommendations to eliminate adverse effect.

f. Military personnel are responsible for evaluating the effect on airspace and routes used by the military.

g. Other applicable FAA offices or services may be requested to provide an evaluation of the structure on a case-by-case basis.

ANYWHERE



- * Obstruction to Air Navigation
- ** Not an Obstruction to Air Navigation

Subpart C - Obstruction Standards

§77.23(a)(1) - An object would be an obstruction to air navigation if of greater height than 500 feet above ground level at its site.

FIG 6-3-1

6-3-7. AIRPORT SURFACES AND CLEARANCE AREAS

a. CIVIL AIRPORT SURFACES

1. Civil airport imaginary surfaces are defined in Section 77.25 and are based on the category of each runway according to the type of approach (visual, nonprecision, or precision) available or planned for each runway end (see FIG 6-3-3). The appropriate runway imaginary surface shall be applied to the primary surfaces related to the physical end of the specific runway surface that is usable for either takeoff or landing.

2. Approach Surface Elevation - Use the runway centerline elevation at the runway threshold and the elevation of the helipad as the elevation from which the approach surface begins (see Sections 77.25 and 77.29).

3. Heliport imaginary surfaces are defined in Section 77.29 and are based upon the size of the takeoff and landing area.

4. Planned Airport/Runway Improvements - Consider the planned runway threshold and approach type when there is a plan on file with the FAA, or with an appropriate military service to extend the runway, and/or upgrade its use or type of approach. The existing runway threshold and type of approach may be used for temporary structures/equipment, as appropriate.

b. MILITARY AIRPORT SURFACES - The obstruction standards in Section 77.25, Civil Airport Imaginary Surfaces, apply to civil operated joint-use airports. The obstruction standards in Section 77.28, Military Airport Imaginary Surfaces, are applicable only to airports operated and controlled by a military service of the United States, regardless of whether use by civil aircraft is permitted.

c. TERMINAL OBSTACLE CLEARANCE AREA - The terminal obstacle clearance area specified in Section 77.23(a)(3) includes the initial, intermediate, final, and missed approach segments of an instrument approach procedure, and the circling approach and instrument departure areas. The applicable FAA approach and departure design criteria are contained in the 8260.3 Order series.

d. EN ROUTE OBSTACLE CLEARANCE AREA - The en route obstacle clearance area specified in Section 77.23(a)(4) is applicable when evaluating the effect of a structure on an airway, a feeder route, and/or an approved off-airway route (direct route) as prescribed in the 8260.3 Order series.

6-3-8. EVALUATING EFFECT ON VFR OPERATIONS

a. PURPOSE - These guidelines are for use in determining the effect of structures, whether proposed or existing, upon VFR aeronautical operations in the navigable airspace. The intent of these guidelines is to provide a basis for analytical judgments in evaluating the effect of proposals on VFR operations.

b. CONSIDERATIONS

1. Minimum VFR Flight Altitudes - Minimum VFR flight altitudes are prescribed by regulation. Generally speaking, from a VFR standpoint, the navigable airspace includes all airspace 500 feet AGL or greater and that airspace below 500 feet required for:

(a) Takeoff and landing, including the airport traffic pattern;

(b) Flight over open water and sparsely populated areas (an aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure); and

(c) Helicopter operations when the operation may be conducted without hazard to persons and property on the surface.

2. VFR Weather Minimums - Proposed or existing structures potentially have the greatest impact in those areas where VFR operations are conducted when ceiling and/or visibility conditions are at or near VFR weather minimums. Any structure that would interfere with a significant volume of low altitude flights by actually excluding or restricting VFR operations in a specific area would have a substantial adverse effect and may be considered a hazard to air navigation.

3. Marking and/or Lighting of Structures - Not every structure penetrating the navigable airspace is considered to be a hazard to air navigation. Some may be marked and/or lighted so pilots can visually observe and avoid the structures.

4. **Shielded Structures** - A structure may be "shielded" by being located in proximity to other permanent structures or terrain and would not, by itself, adversely affect aeronautical operations (see paragraph 6-3-13).

5. **Height Of Structures** - Structures are of concern to pilots during a climb after takeoff, low altitude operations, and when descending to land. Any structure greater than 500 feet AGL, or structures of any height which would affect landing and takeoff operations, requires extensive evaluation to determine the extent of adverse effect on VFR aeronautical operations.

6. **Airport Traffic Patterns** - The primary concern regarding structures in airport traffic pattern areas is whether they would create a dangerous situation during a critical phase of flight.

7. **Class B and C Airspace** - Structures that exceed obstruction standards in areas available for VFR flight below the floor of Class B or C airspace areas require careful evaluation. Class B and C airspace areas are designed to provide a more regulated environment for IFR and VFR traffic in and around certain airports. Consequently, the floors of some Class B and C areas compress VFR operations into airspace of limited size and minimum altitude availability.

8. **VFR Routes** - Pilots operating VFR frequently fly routes that follow rivers, coastlines, mountain passes, valleys, and similar types of natural landmarks; or major highways, railroads, powerlines, canals, and other manmade structures. A VFR route may also be comprised of specific radials of a Very High Frequency Omnidirectional Range (VOR). These routes may correspond to an established Federal Airway, direct radials between navigation facilities, or a single radial providing transition to a route predicated on visual aids. While there may be established minimum en route altitudes for segments of these routes and navigation is dependent upon adequate signal reception, a VFR pilot may fly at an altitude below the established minimum altitude in order

to maintain visual contact with the ground. The basic consideration in evaluating the effect of obstructions on operations along these routes is whether pilots would be able to visually observe and avoid them during marginal VFR weather conditions. At least 1-mile flight visibility is required for VFR operations beneath the floor of controlled airspace. This means that a surface reference used for VFR low altitude flight must be horizontally visible to pilots for a minimum of 1 mile.

c. **EN ROUTE OPERATIONS** - The area considered for en route VFR flight begins and ends outside the airport traffic pattern airspace area, or Class B, C, and D airspace areas.

1. A structure would have an adverse effect upon VFR air navigation if its height is greater than 500 feet above the surface at its site, and within 2 statute miles of any regularly used VFR route (see FIG 6-3-10).

2. Evaluation of obstructions located within VFR routes must recognize that pilots may, and sometimes do, operate below the floor of controlled airspace during low ceilings and 1-mile flight visibility. When operating in these weather conditions and using pilotage navigation, these flights must remain within 1 mile of the identifiable landmark to maintain visual reference. Even if made more conspicuous by the installation of high intensity white obstruction lights, a structure placed in this location could be a hazard to air navigation because after sighting it, the pilot may not have the opportunity to safely circumnavigate or overfly the structure

3. **VFR MILITARY TRAINING ROUTES (VR)** - Operations on VRs provide military aircrews low altitude, high speed navigation and tactics training, and are a basic requirement for combat readiness (see FAA Order 7610.4, Special Military Operations). Surface structures have their greatest impact on VFR operations when ceiling and visibility conditions are at or near basic VFR minimums. Accordingly, the guidelines for a finding of substantial adverse

effect on en route VFR operations are based on consideration for those operations conducted under part 91 that permits flight clear of clouds with 1 mile flight visibility outside controlled airspace. In contrast, flight along VRs can be conducted only when weather conditions equal or exceed 3,000 feet ceiling and 5 miles visibility. A proposed structure's location on a VR is not a basis for determining it to be a hazard to air navigation; however, in recognition of the military's requirement to conduct low altitude training, disseminate part 77 notices and aeronautical study information to military representatives. Additionally, attempt to persuade the sponsor to lower or relocate a proposed structure that exceeds obstruction standards and has been identified by the military as detrimental to its training requirement.

d. AIRPORT AREAS - Consider the following when determining the effect of structures on VFR operations near airports:

1. Traffic Pattern Airspace - There are many variables that influence the establishment of airport arrival and departure traffic flows. Structures in the traffic pattern airspace may adversely affect air navigation by being a physical obstruction to air navigation or by distracting a pilot's attention during a critical phase of flight. The categories of aircraft using the airport determine airport traffic pattern airspace dimensions.

(a) Traffic Pattern Airspace dimensions (See FIG 6-3-11).

(b) Within Traffic Pattern Airspace - A structure that exceeds a 14 CFR, part 77 obstruction standard and that exceeds any of the following heights is considered to have an adverse effect and would have a substantial adverse effect if a significant volume of VFR aeronautical operations are affected, except as noted in paragraph 6-3-8 d.1.(c) and (d) (see FIG 6-3-12).

(1) The height of the transition surface (other than abeam the runway), the approach slope (up to the height of the horizontal surface), the horizontal surface, and the conical surface (as applied to visual approach runways, Section 77.25).

(2) Beyond the lateral limits of the conical surface and in the climb/descent area - 350 feet above airport elevation or the height of 14 CFR Section 77.23a.(2), whichever is greater not to exceed 500 feet above ground level (AGL). The climb/descent area begins abeam the runway threshold being used and is the area where the pilot is either descending to land on the runway or climbing to pattern altitude after departure (the area extending outward from a line perpendicular to the runway at the threshold, see FIG 6-3-13).

(3) Beyond the lateral limits of the conical surface and not in the climb/descent area of any runway - 500 feet above airport elevation (AE) not to exceed 500 feet AGL.

(c) An existing structure (that has been previously studied by the FAA), terrain, or a proposed structure (that would be shielded by existing structures) may not be considered to have a substantial adverse effect. In such instances, the traffic pattern may be adjusted as needed on a case-by-case basis.

(d) Exceptions may be made on a case-by-case basis when the surrounding terrain is significantly higher than the airport elevation, the established traffic pattern altitude is less than 800 feet above airport elevation, or "density altitude" is a consideration.

2. Terminal Transition Routes - A structure would have an adverse effect upon VFR air navigation if it:

(a) Exceeds a height of 500 feet above the surface at its site; and

VFR ROUTES

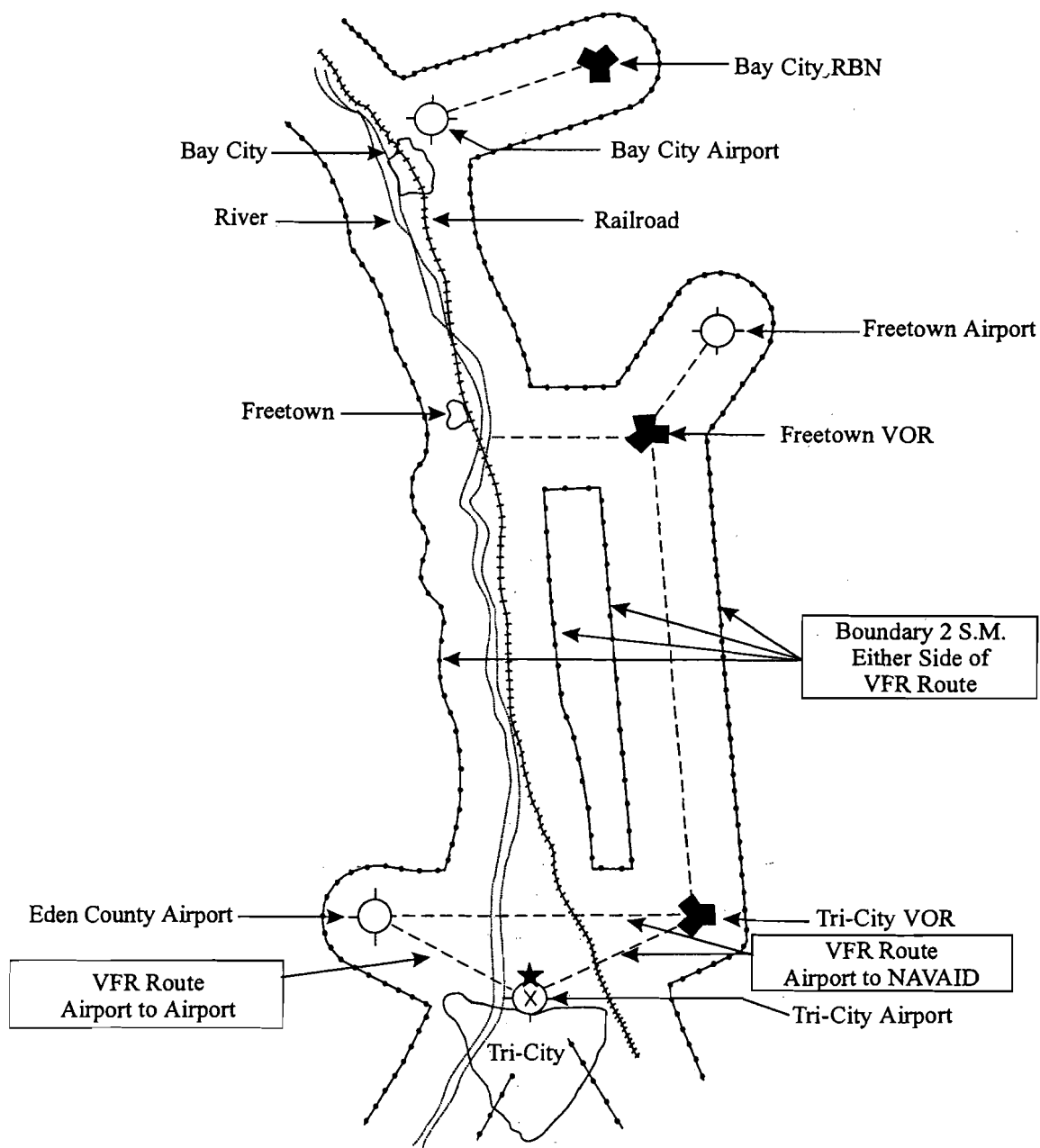


FIG 6-3-10

1. Minimum En Route Altitudes (MEA) - MEAs are established for each segment of an airway, or an approved route based upon obstacle clearance, navigational signal reception, and communications. The MEA assures obstruction clearance and acceptable navigational signal coverage over the entire airway or route segment flown. Any structure that will require an MEA to be raised has an adverse effect. Careful analysis by the appropriate Flight Procedures and AT personnel is necessary to determine if there would be a substantial adverse effect on the navigable airspace. Generally, the loss of a cardinal altitude is considered a substantial adverse effect. However, the effect may not be substantial if the aeronautical study discloses that the affected MEA is not normally flown by aircraft, nor used for air traffic control purposes.

2. Minimum Obstruction Clearance Altitudes (MOCA) - MOCAs assure obstacle clearance over the entire route segment to which they apply and assure navigational signal coverage within 22 nautical miles of the associated VOR navigational facility. For that portion of the route segment beyond 22 nautical miles from the VOR, where the MOCA is lower than the MEA and there are no plans to lower the MEA to the MOCA, a structure that affects only the MOCA would not be considered to have substantial adverse effect. Other situations require study as ATC may assign altitudes down to the MOCA under certain conditions.

3. Minimum IFR Altitudes (MIA) - These altitudes are established in accordance with Order 7210.37, En Route Minimum IFR Altitude Sector Charts, to provide the controller with minimum IFR altitude information for off-airway operations. MIAs provide the minimum obstacle clearance and are established without respect to flight-checked radar or normal radar coverage. Any structure that would cause an increase in a MIA is an obstruction, and further study is required to determine the extent of adverse effect. Radar coverage adequate to vector around such a structure is not, of itself, sufficient to mitigate a finding of substantial adverse effect that would otherwise be the basis for a determination of hazard to air navigation.

4. IFR Military Training Routes (IR's) - Operations on IR's provide pilots with training for low altitude navigation and tactics (see FAAO 7610.4, Special Military Operations). Flight along these routes can be conducted below the minimum IFR altitude specified in part 91, and the military conducts operational flight evaluations of each route to ensure compatibility with their obstruction clearance requirements. A proposed structure's location on an IR is not a basis for determining it to be a hazard to air navigation; however, in recognition of the military's requirement to conduct low altitude training, disseminate part 77 notices and aeronautical study information to military representatives. Additionally, attempt to persuade the sponsor to lower, or relocate proposed structures that exceed obstruction standards and have been identified by the military as detrimental to their training requirement.

5. Radar Bomb Sites (RBS) - These sites are a vital link in the low level training network used by the U.S. Air Force to evaluate bomber crew proficiency. They provide accurate radar records for aircraft flying at low altitudes attacking simulated targets along the RBS scoring line. An obstruction located within the flights' RBS boundaries may have a substantial adverse effect and a serious operational impact on military training capability.

e. TERMINAL AREA IFR OPERATIONS - The obstruction standards contained in part 77 are also used to identify obstructions within terminal obstacle clearance areas. Any structure identified as an obstruction is considered to have an adverse effect; however, there is no clear-cut formula to determine what extent of adverse effect is considered substantial. Instrument approach and departure procedures are established in accordance with published obstacle clearance guidelines and criteria. However, there are segments of instrument approach procedures where the minimum altitudes may be revised without substantially effecting landing minimums. Thus, the determination must represent a decision based on the best facts that can be obtained during the aeronautical study.

1. Instrument Approach Procedures (IAP) - Flight Procedures personnel are responsible for evaluating the effect of structures upon any segment of an IAP, any proposed IAP, or any departure restriction. However, all FAA personnel involved in the obstruction evaluation process should be familiar with all aspects of the terminal area IFR operations being considered. If Flight Procedures personnel determine that a structure will affect instrument flight procedures, their evaluation should include those procedural adjustments that can be made without adversely affecting IFR operations. When the study discloses that procedural adjustments to reduce or mitigate any adverse effect cannot be accomplished, then the comments to Air Traffic shall identify the significance of this effect on procedures and aeronautical operations.

2. Minimum Vectoring Altitudes (MVA) - These altitudes are based upon obstruction clearance requirements only (see Order 8260.19). The area considered for obstacle clearance is the normal operational use of the radar without regard to the flight-checked radar coverage. It is the responsibility of individual controllers to determine that a target return is adequate for radar control purposes. MVAs are developed by terminal facilities, approved by the National Flight Procedures Office, AVN-100, and published for controllers on MVA Sector Charts. Any structure that would cause an increase in an MVA is an obstruction and a study is required to determine the extent of adverse effect. Radar coverage adequate to vector around such a structure is not, of itself, sufficient to mitigate a finding of substantial adverse effect that would otherwise be the basis for a determination of hazard to air navigation.

3. Military Airports - With the exception of the U.S. Army, the appropriate military commands establish and approve terminal instrument procedures for airports under their respective jurisdictions. Consequently, the ATD responsible for the issuance of a determination shall ensure that the military organizations are provided the opportunity to evaluate a structure that may affect their operations. While the military has the responsibility for determining the effect of a structure, it is expected that the FPO will assist Air Traffic in reconciling differences in the military findings.

4. Departure Procedures - TERPS, Chapter 12, Civil Utilization of Area Navigation (RNAV) Departure Procedures, contains criteria for the development of IFR departure procedures. Generally, any obstacle that penetrates the 40:1 slope should be evaluated on a case-by-case basis to determine the need for a departure restriction.

5. Minimum Safe Altitudes (MSA) - A MSA is the minimum obstacle clearance altitude for emergency use within a specified distance from the navigation facility upon which a procedure is predicated. These are either Minimum Sector Altitudes, established for all procedures within a 25-mile radius of the navigational facility (may be increased to 30 miles under certain conditions), or Emergency Safe Altitudes, established within a 100-mile radius of the navigation facility and normally used only in military procedures at the option of the approval authority. These altitudes are designed for emergency use only and are not routinely used by pilots or by air traffic control. Consequently, they are not considered a factor in determining the extent of adverse effect, used as the basis of a determination, or addressed in the public notice of an aeronautical study.

f. CONSIDERING ACCURACY - Experience has shown that submissions often contain elevation and/or location errors. For this reason, Flight Procedures uses vertical and horizontal accuracy adjustments, as reflected below, to determine the effect on IFR operations.

1. Accuracy Application - Current directives require the FPO to apply accuracy standards to obstacles when evaluating effects on instrument procedures. These accuracy standards typically require an adjustment of 50 feet vertically and 250 feet horizontally to be applied in the most critical direction. Normally, these adjustments are applied to those structures that may become the controlling obstructions and are applicable until their elevation and location are verified by survey.

2. Certified Accuracy - The FPO shall notify Air Traffic whenever certified accuracy is needed to determine if the structure will have an adverse effect. Air Traffic shall then contact the sponsor to request a surveyed verification of the elevation and location. The acceptable accuracy

verification method must be provided and certified by a licensed engineer or surveyor. The survey must include the plus or minus accuracy required by the FPO, as well as the signature of the engineer/surveyor and the appropriate seal.

3. Determination - A final determination based on improved accuracy shall not be issued until after the certified survey is received and evaluated.

4. Survey Information Distribution - When the certified survey is received, Air Traffic personnel shall ensure that the survey information is provided to FPO personnel and shall send to NACO a copy of the survey attached to the FAA form 7460-2, Notice of Actual Construction or Alteration.

6-3-10. EVALUATING EFFECT ON AIR NAVIGATION AND COMMUNICATION FACILITIES

a. The FAA is authorized to establish, operate, and maintain air navigation and communications facilities and to protect such facilities from interference. During evaluation of structures, factors that may adversely affect any portion or component of the NAS must be considered. Since an electromagnetic interference potential may create adverse effects as serious as those caused by a physical penetration of the airspace by a structure, those effects shall be identified and stated. Proposals will be handled, when appropriate, directly with FCC through ASR-100.

b. Airway Facilities personnel shall evaluate notices to determine if the structure will affect the performance of existing or proposed NAS facilities. The study must also include any plans for future facilities, proposed airports, or improvements to existing airports.

c. The physical presence of a structure and/or the electromagnetic signals emanating or reflecting therefrom may have a substantial adverse effect on the availability, or quality of navigational and communications signals, or on air traffic services needed for the safe operation of aircraft. The following general guidelines are provided to assist in determining the anticipated interference.

1. Instrument Landing System (ILS) - Transmitting antennas are potential sources of

electromagnetic interference that may effect the operation of aircraft using an ILS facility. The antenna height, radiation pattern, operating frequency, effective radiated power (ERP), and its proximity to the runway centerline are all factors contributing to the possibility of interference. Normally, any structure supporting a transmitting antenna within the established localizer and/or glide-slope service volume area must be studied carefully. However, extremes in structure height, ERP, frequency, and/or antenna radiation pattern may require careful study of structures up to 30 nautical miles from the ILS frequency's protected service volume area.

(a) ILS Localizer - Large mass structures adjacent to the localizer course and/or antenna array are potential sources of reflections and/or re-radiation that may affect facility operation. The shape and intensity of such reflections and/or re-radiation depends upon the size of the reflecting surface and distance from the localizer antenna. The angle of incidence reflection in the azimuth plane generally follows the rules of basic optical reflection. Normally, in order to affect the course, the reflections must come from structures that lie in or near the on-course signal. Large mass structures of any type, including metallic fences or powerlines, within plus/minus 15 degrees of extended centerline up to 1 NM from the approach end of the runway and any obstruction within 500 feet of the localizer antenna array must be studied carefully. (Refer to FAA Order 6750.16, Siting Criteria for Instrument Landing Systems).

(b) ILS Glide Slope - Vertical surfaces within approximately 1,000 feet of the runway centerline and located up to 3,000 feet forward of the glide slope antenna can cause harmful reflections. Most interference to the glide slope are caused by discontinuities in the ground surface, described approximately as a rectangular area 1,000 feet wide by 5,000 feet long, extending forward from the glide slope antenna and centered at about the runway centerline. Discontinuities are usually in the form of rough terrain or buildings. (Refer to FAA Order 6750.16, Siting Criteria for Instrument Landing Systems.)

2. Microwave Landing System (MLS) - The guidelines stated for ILS systems above also apply to MLS installations. The established MLS service volume defines the area of concern.

3. Very High Frequency Omni -Directional Radio Range and Tactical Air Navigation Aid (VOR/TACAN) - Usually, there should be no reflecting structures or heavy vegetation (trees, brush, etc.) within a 1,000 foot radius of the VOR or the TACAN antenna. Interference may occur from large structures or powerlines up to 2 NM from the antenna. (Refer to FAA Order 6820.10 VOR, VOR/DME, and TACAN Siting Criteria).

4. Air Route Surveillance Radar/Airport Surveillance Radar (ARSR/ASR) - Normally, there should be no reflecting structures within a 1,500-foot radius of the radar antenna. In addition, large reflective structures up to 3 NM from the antenna can cause interference unless they are in the "shadow" of topographic features.

5. Air Traffic Control Radar Beacon (ATCRB) - The effects encountered due to reflections of the secondary radar main lobe are more serious than those associated with primary radar. Therefore, it is necessary to ensure that no large vertical reflecting surface penetrates a 1,500-foot radius horizontal plane located 25 feet below the antenna platform. In addition, interference may occur from large structures up to 12 miles away from the antenna. This distance will depend on the area of the reflecting surface, the reflection coefficient of the surface, and its elevation with respect to the interrogator antenna. (Refer to FAA Order 6310.6, Primary/Secondary Terminal Radar Siting Handbook).

6. Directional Finder (DF) - The DF antenna site should be free of structures that will obstruct line-of-sight with aircraft at low altitudes. The vicinity within 300 feet of the antenna should be free of metallic structures which can act as re-radiators.

7. Communication Facilities - Minimum desirable distances to prevent interference problems between communication facilities and other construction are:

(a) 1,000 feet from power transmission lines (other than those serving the facility) and other radio or radar facilities;

(b) 300 feet from areas of high vehicle activity such as highways, busy roads, and large parking areas; and

(c) One (1) NM from commercial broadcasting stations (e.g., FM, TV).

8. Approach Lighting System - No structure, except the localizer antenna, the localizer far field monitor antenna, or the marker antenna shall protrude above the approach light plane. For approach light plane clearance purposes, all roads, highways, vehicle parking areas, and railroads shall be considered as vertical solid structures. The clearance required above interstate highways is 17 feet; above railroads, 23 feet; and for all other public roads, highways, and vehicle parking areas, 15 feet. The clearance required for a private road is 10 feet or the highest mobile structure that would normally use the road, which would exceed 10 feet. The clearance for roads and highways shall be measured from the crown of the road; the clearance for railroads shall be measured from the top of the rails. For vehicle parking areas, clearance shall be measured from the average grade in the vicinity of the highest point. Relative to airport service roads substantial adverse effect can be eliminated if all vehicular traffic is controlled or managed by the air traffic control facility. A clear line-of-sight is required to all lights in the system from any point on a surface, one-half degree below the aircraft descent path and extending 250 feet each side of the runway centerline, up to 1,600 feet in advance of the outermost light in the system. The effect of parked or taxiing aircraft shall also be considered when evaluating line-of-sight for approach lighting systems.

9. Visual Approach Slope Indicator (VASI)/Precision Approach Path Indicator (PAPI) - No structures or obstructions shall be placed within the clearance zone for the particular site involved or the projected visual glide path.

NOTE-

VASI and PAPA now fall under the heading of VGSI.

10. Runway End Identifier Lights (REIL) - No structures or obstructions shall be placed within the established clearance zone.

d. Factors that modify the evaluation criteria guidelines require consideration. Some facility signal areas are more susceptible to interference than others. The operational status of some signals may already be marginal because of existing interference from other structures. In addition, the following characteristics of structures must be considered:

1. The higher the structure's height is in relation to the antenna, the greater the chance of interfering reflections. Any structure subtending a vertical angle greater than one degree from the facility is usually cause for concern. Tall structures, such as radio towers and grain elevators, can interfere from distances greater than those listed in the general criteria.

2. The type of construction material on the reflecting surface of the structure is a factor, with nonmetallic surfaces being less troublesome than metallic or metallic impregnated glass.

3. Aircraft hangars with large doors can be a special problem because the reflecting surface of the hangar varies appreciably with changes in the position of the doors.

4. Interference is usually caused by mirror reflections from surfaces on the structure. Orientation of the structure therefore plays an important part in the extent of the interference. Reflections of the largest amplitude will come from signals striking a surface perpendicular to the signals. Signals striking a surface at a shallow angle will have a smaller amplitude.

e. Air Traffic personnel shall request Airway Facilities personnel to assist them in discussions with sponsors to explore alternatives to resolve the prospective adverse effects to facilities. These may involve design revisions, relocation, or reorientation depending on the character of the construction and facility involved.

f. Attempt to resolve electromagnetic interference (EMI) before issuing a hazard determination. Notify the sponsor by letter (automated DPH letter) that the structure may create harmful EMI and include in the letter the formula and values that were applied, the

specific adverse effects expected, and an offer to consider alternatives. Provide the sponsor, as well as the FAA, ample time to exhaust all available avenues for positive resolution. The intent of this process is to allow the sponsor adequate time to consider the problems and the alternatives before a decision is rendered by the issuance of the FAA determination. Follow these guidelines in all situations where harmful EMI is projected by the study.

6-3-11. EVALUATING PLANNED OR FUTURE AIRPORT DEVELOPMENT PROGRAMS

The national system of airports consists of public, civil, and joint-use airport facilities considered necessary to adequately meet the anticipated needs of civil aeronautics. Airport Planning and Programming Offices are the most accurate sources of up-to-date information on airport development plans. Consequently, Airports personnel are expected to extensively review structures in reference to the safe and orderly development of airport facilities, including what development will realistically be accomplished within a reasonable time. Areas of consideration in accomplishing this responsibility are:

- a. Future Development of Existing Airports - A detailed review in this area requires looking at current planned airport projects, national airport plan data, and land-use planning studies in the vicinity of the structure. The results of the study forwarded to Air Traffic shall include appropriate comments regarding the extent of Federal aid, sponsor airport investments, the airport owner's obligations in existing grant-in-aid agreements, and anticipated aeronautical activity at the airport and in the general area. If a structure would adversely impact an airport's efficiency, utility, or capacity, the responsible Airports Office should document this impact in its evaluation. Comments should include recommended new location(s) for the structure as appropriate.

- b. New Airport Development - When a structure requiring notice under part 77 and any new airport development are both in the same vicinity, Airports personnel shall study the interrelationship of the structure and the airport. Additionally, supplemental information on the

proposed airport site shall be furnished to Air Traffic. If a substantial adverse effect is anticipated, Airports personnel shall provide detailed comments and specific recommendations for mitigating the adverse effects.

6-3-12. EVALUATING TEMPORARY CONSTRUCTION

a. Temporary Construction Equipment - Construction of structures normally requires use of temporary construction equipment that is of a greater height than the proposed structure. Appropriate action is necessary to ensure that the temporary construction equipment does not present a hazard to air navigation. It is not possible to set forth criteria applicable to every situation; however, the following action examples may help to minimize potential problems:

1. If use of the temporary construction equipment is on an airport, it may be necessary to negotiate with airport managers/owners to close a runway, taxiway, temporarily move a runway threshold, or take other similar action.

2. Negotiate with equipment operators to raise and lower cranes, derricks, or other construction equipment when weather conditions go below predetermined minimums as necessary for air traffic operations or as appropriate for the airport runways in use.

3. Control the movement of construction vehicle traffic on airports.

4. Adjust minimum IFR altitudes or instrument procedures as necessary to accommodate the construction equipment if such action will not have serious adverse effects on aeronautical operations.

5. Request that the temporary construction equipment be properly marked and/or lighted if needed.

b. Temporary Structures - OE notices for temporary structures are processed in the same manner as a permanent structure, but require special consideration in determining the extent of adverse effect. This is especially true of structures such as cranes and derricks that may only be at a particular site for a short time

period. As a general policy, it is considered in the public interest to make whatever adjustments necessary to accommodate the temporary structure of 30 days or less if there is no substantial adverse affect on aeronautical operations or procedures. However, this policy does not apply if the aeronautical study discloses that the structure would be a hazard to aviation. Reasonable adjustments in aeronautical operations and modifications to the temporary structure should be given equal consideration.

6-3-13. CONSIDERING SHIELDING

Shielding as described below should not be confused with notice criteria as stated in Section 77.15(c).

a. Consideration - Shielding is one of many factors that must be considered in determining the physical effect a structure may have upon aeronautical operations and procedures. Good judgment, in addition to the circumstances of location and flight activity, will influence how this factor is considered in determining whether proposed or existing structures would be physically shielded.

b. Principle - The basic principle in applying the shielding guidelines is whether the location and height of the structures are such that aircraft, when operating with due regard for the shielding structure, would not collide with that structure.

c. Limitations - Application of the shielding effect is limited to:

1. The physical protection provided by existing natural terrain, topographic features, or surface structures of equal or greater height than the structure under study; and

2. The structure(s) providing the shielding protection is/are of a permanent nature and there are no plans on file with the FAA for the removal or alteration of the structure(s).

d. Guidelines - Any proposed construction of or alteration to an existing structure is normally considered to be physically shielded by one or more existing permanent structure(s), natural terrain, or topographic feature(s) of equal or greater height if the structure under consideration is located:

1. Not more than 500 feet horizontal distance from the shielding structure(s) and in the congested area of a city, town, or settlement, provided the shielded structure is not located closer than the shielding structures to any heliport or airport located within 5 miles of the structure(s);

2. Such that there would be at least one such shielding structure situated on at least three sides of the shielded structure at a horizontal distance of not more than 500 feet; or

3. Within the lateral dimensions of any runway approach surface but would not exceed an overall height above the established airport elevation greater than that of the outer extremity of the approach surface, and located within, but would not penetrate, the shadow plane(s) of the shielding structure(s).

e. ATD shall coordinate with FPO before applying shielding criteria for precision approach surface penetrations.

NOTE-

See FIG 6-3-9 and FIG 6-3-14.

6-3-14. CONSIDERING SHADOW PLANE

The term "shadow plane" means a surface originating at a horizontal line passing through the top of the shielding structure at right angles to a straight line extending from the top of the shielding structure to the end of the runway. The shadow plane has a width equal to the projection of the shielding structure's width onto a plane normal to the line extending from the top and center of the shielding structure to the midpoint of the runway end. The shadow plane extends horizontally outward away from the shielding structure until it intersects or reaches the end of one of the imaginary approach area surfaces; see FIG 6-3-15, FIG 6-3-16, and FIG 6-3-17.

6-3-15. RECOMMENDING MARKING AND LIGHTING OF STRUCTURES

a. **STANDARDS** - FAA standards, procedures, and types of equipment specified for marking and lighting structures are presented in AC 70/7460-1, Obstruction Marking and Lighting. These standards provide a uniform means to indicate the presence of structures and are the basis for recommending marking and

lighting to the public. These standards are the minimum acceptable level of conspicuity to warn pilots of the presence of structures. They shall also apply when Federal funds are to be expended for the marking and lighting of structures.

b. **AERONAUTICAL STUDY** - All aeronautical studies shall include an evaluation to determine whether obstruction marking and/or lighting are necessary and to what extent. The entire structure or complex, including closely surrounding terrain and other structures, must be considered in recommending marking and lighting. A subsequent study may indicate a need to change an earlier determination by recommending marking and/or lighting when such recommendation was not made in the original study or, in some cases, after a determination was issued.

1. **Proposed Structures** - A change in runway length or alignment, a new airport development project, a change in aeronautical procedures, or other similar reasons may be cause for additional study of proposed structures to determine whether marking and/or lighting are now appropriate even when not recommended in the original study.

2. **Existing Structures** - A marking and/or lighting recommendation may be made at any time. In making the recommendation consider changes that have occurred in the vicinity of the structure since the initial determination was made and include such factors as increased aircraft activity, the closing of an airport, changes in IFR and VFR routes, and shielding by taller structures.

c. **RECOMMENDATIONS** - Recommend the marking and/or lighting standard most appropriate for the height and location of any temporary or permanent structure that:

1. Exceeds 200 feet in overall height above ground level at its site or exceeds any obstruction standard contained in part 77, Subpart C, unless an aeronautical study shows the absence of such marking and/or lighting will not impair aviation safety; or

2. Is not more than 200 feet AGL, or is not identified as an obstruction under the standards of part 77, Subpart C, but may indicate by its

particular location a need to be marked or lighted to promote aviation safety.

d. PARTIAL MARKING AND/OR LIGHTING - Omitting marking and/or lighting on the structure's bottom section; e.g., the lowest 200 feet of a tall structure should be discouraged unless that part of the structure is shielded. Marking and lighting standards are based on a total system configuration and are only effective when used as intended. Therefore, the structure and its location must be given careful consideration before recommending partial marking and/or lighting.

e. OMISSION/DELETION OF MARKING AND/OR LIGHTING - When recommending that marking and/or lighting be omitted because the structure is sufficiently conspicuous by its shape, size, and/or color, include a judgment that the structure would not blend into any physical or atmospheric background that may reasonably be expected in the vicinity.

f. EXCESSIVE MARKING AND/OR LIGHTING - Recommend specific advisory circular chapters, paragraphs, and, when appropriate, specific intensities that address the minimum marking and/or lighting standards for safety. Recommendation of specific chapters allow for the use of those chapters only, although they may contain references to other chapters. If the sponsor insists on or the FAA finds that high intensity white lights would not be objectionable, indicate in the determination that the FAA does not object to increased conspicuity provided the lighting is in accordance with guidelines of AC 70/7460-1, Obstruction Marking and Lighting.

g. VOLUNTARY MARKING AND/OR LIGHTING - When it is determined not necessary for aviation safety, marking and/or lighting may be accomplished on a voluntary basis. However, marking and/or lighting should not be a condition of the determination, but instead, it shall be recommended that, if voluntary, marking and/or lighting be installed and maintained in accordance with AC 70/7460-1.

h. HIGH AND MEDIUM INTENSITY WHITE OBSTRUCTION LIGHTING SYSTEMS -

1. High intensity lighting systems should not be recommended for structures less than 500 feet above ground level except when an aeronautical study shows otherwise. This does not apply to catenary support structures.

2. Use caution in recommending the use of high or medium intensity white obstruction lighting systems, especially in a populated area. Aircraft operations can be adversely affected where strobe-lighted structures are located in an area of limited visual cues. These situations can contribute to spatial disorientation when pilots are maneuvering in minimum visibility conditions. Marine or surface vessels and other vehicles, especially on nearby elevated roadways, could also experience operational difficulties from strobe lights. External shielding may minimize adverse effects. Examples are:

(a) At locations within the airport/heliport environment in a sparsely lighted rural setting.

(b) At an offshore installation.

3. Dual lighting systems should be considered when a structure is located in or near residential areas, especially in hilly terrain where some houses are higher than the base of the structure.

i. LIGHTED SPHERICAL MARKERS - Lighted spherical markers are available for increased night conspicuity of high-voltage (69kv or greater) transmission-line catenary wires. These markers should be recommended for increased night conspicuity for such wires when located near airports, heliports, across rivers, canyons, lakes, etc. Consider the following when recommending lighted spherical markers: aeronautical activity, nighttime operations, low level operations, local weather conditions, height of wires, length of span, etc. If the support structures are to be lighted, also consider lighting the catenary wires. Installation, size, color, and pattern guidelines can be found in Advisory Circular 70/7460-1, Obstruction Marking and Lighting.

j. DEVIATIONS AND MODIFICATION TO MARKING AND/OR LIGHTING - When the sponsor or owner of a structure requests

permission to deviate from or modify the recommended marking and/or lighting, an appropriate aeronautical study should be made to determine whether the deviation/modification is acceptable, and/or whether the recommended marking and/or lighting should be retained.

1. A deviation refers to a change from the standard patterns, intensities, flashing rates, etc. A marking and lighting deviation is considered to be marking patterns or colors and lighting patterns, intensities, flashing rates, or colors other than those specified in AC 70/7460-1.

(a) Requests for deviations shall be forwarded to ATA-400 only after an aeronautical study has been conducted on the proposal. The results of the study and the regional recommendation shall be submitted with the request.

(b) Deviations require approval by the Program Director for Airspace Management, ATA-1. The Airspace and Rules Division shall effect all coordination necessary for issuing the decision to approve or disapprove. The approval or disapproval decision shall be forwarded to the region for response to the sponsor. Examples of deviations are contained in AC 70/7460-1.

2. The regional ATD may approve a request for a modified application of marking and/or lighting. Examples of modified applications may be found in AC 70/7460-1. A modified application of marking and lighting refers to the amount of standard marking and/or lighting such as:

(a) Placing the standard marking and/or lighting on only a portion of a structure;

(b) Adding marking and/or lighting in addition to the standard marking and lighting to improve the conspicuity of the structure;

(c) Reducing the amount of standard marking and/or lighting to the extent of eliminating one or the other as may be considered appropriate; or

(d) Adjusting the standard spacing of recommended intermediate light levels for ease of installation and maintenance as considered appropriate.

6-3-16. NEGOTIATIONS

Negotiations shall be attempted with the sponsor to reduce the structure's height so that it does not exceed obstruction standards, mitigate any adverse effects on aeronautical operations, air navigation and/or communication facilities, or eliminate substantial adverse effect. If feasible, recommend collocation of the structure with other structures of equal or greater heights. Include in the aeronautical study file and determination a record of all the negotiations attempted and the results. If negotiations result in the withdrawal of the OE notice, the obstruction evaluation study may be terminated. Otherwise, the obstruction evaluation shall be continued to its conclusion.

6-3-17. CIRCULARIZATION

a. Circularizing a public notice of aeronautical study provides the opportunity for interested persons to participate by submitting comments for consideration. The ATD, shall determine when it is necessary to distribute a public notice.

1. Normally, any structure that would exceed obstruction standards, affect an airport, have possible VFR affect, and/or require a change in aeronautical operations or procedures should always be circularized.

2. Circularization is not necessary for the following types of studies:

(a) A reduction in the height of an existing structure;

(b) A structure that would be located on a site in proximity to another previously studied structure, would have no greater effect on aeronautical operations and procedures, and the basis for the determination issued under the previous study could be appropriately applied;

(c) A proposed structure replacing an existing or destroyed structure, that would be located on the same site and at the same or lower height as the original structure, and marked and/or lighted under the same provisions as the original structure (this does not preclude a recommendation for additional marking/lighting to ensure conspicuity);

(d) A proposed structure that would be in proximity to, and have no greater effect than, a previously studied existing structure, and no plan is on file with the FAA to alter or remove the existing structure;

(e) A structure that would be temporary and appropriate temporary actions could be taken to accommodate the structure without an undue hardship on aviation;

(f) A structure found to have substantial adverse effect based on an internal FAA study;

(g) A structure that would exceed part 77.23(a)(2) and would be outside the traffic pattern; or

(h) A structure that would affect IFR operations but would only need FAA comment. For instance a structure that:

(1) Would raise a MOCA but not a MEA;

(2) Would raise a MVA; or

(3) Would raise a MIA.

3. Circularization for existing structures will be determined on a case-by-case basis.

b. Each public notice (automated letter CIR) shall contain:

1. A complete, detailed description of the structure including, as appropriate, illustrations or graphics depicting the location of the structure:

(a) On-airport studies - Use airport layout plans or best available graphic.

(b) Off-airport studies - Use the appropriate aeronautical chart. Additional illustrations may be included, as necessary.

2. A complete description of the obstruction standards that are exceeded, the number of feet by which the structure exceeds the standards.

3. An explanation of the potential effects of the structure in sufficient detail to assist interested persons in formulating comments on how the structure would affect aeronautical operations.

4. A date by which comments are to be received. The date established should normally allow interested persons 30 days in which to

submit comments, but a shorter comment period may be established depending upon circumstances.

c. Public notices should be distributed to those who can provide information needed to assist in evaluating the aeronautical effect of the structure. As a minimum, the following governmental agencies, organizations, and individuals should be included on distribution lists due to their inherent aeronautical interests:

1. The sponsor and/or his representative;

2. All known aviation interested persons and groups such as state, city, and local aviation authorities; airport authorities; various military organizations within the DoD; flying clubs; national, state, and local aviation organizations; flight schools; fixed base operators; air taxi, charter flight offices; and other organizations or individuals that demonstrate a specific aeronautical interest such as county judges and city mayors;

3. Airport owners as follows:

(a) All public-use airports within 13 nautical miles of the structure;

(b) All private-use airports within 5 nautical miles of the structure;

4. The specific FAA approach facility, en route facility (ARTCC), and Automated Flight Service Station (AFSS) in whose airspace the structure is located;

5. Flight Standards;

6. An adjacent regional office if the structure is within 13 nautical miles of the regional state boundary; and

7. As appropriate, state and local authorities; civic groups; organizations; and individuals who do not have an aeronautical interest, but may become involved in specific aeronautical cases, shall be included in the notice distribution, and given supplemental notice of actions and proceedings on a case-by-case basis. Those involved should clearly understand that the public notice is to solicit aeronautical comments concerning the physical effect of the structure on the safe and efficient use of airspace by aircraft.

d. Document and place in the obstruction evaluation file the names of each person and/or organizations to which public notice was sent. Reference to a distribution code, mailing list, or other evidence of circularization is sufficient provided a printout or list of each coded distribution is maintained for future reference. Also record the time period during which each printout or list is used. The retention schedule is listed in Order 1350.15, Records Organization, Transfer, and Destruction Standards.

e. Consider only valid aeronautical objections or comments in determining the extent of adverse effect of the structure. Comments of a non-aeronautical nature are not considered in obstruction evaluation as described in part 77.

f. If the sponsor agrees to revise the project so that it does not exceed obstruction standards and would have no adverse effect, cancel the public notice, advise interested parties, as necessary, revise the obstruction evaluation study, and proceed as appropriate.

**STANDARDS FOR DETERMINING SHIELDING: CONGESTED PART
OF CITY, TOWN, OR SETTLEMENT**

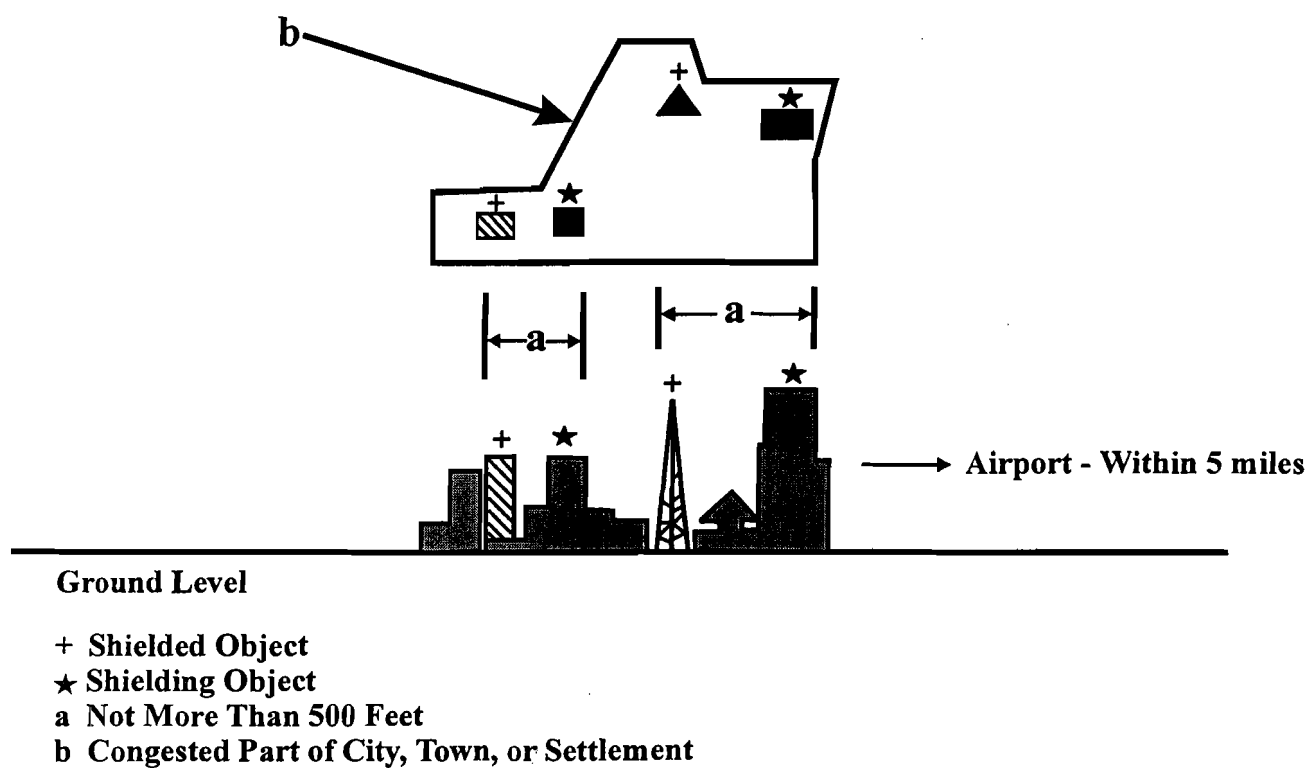


FIG 6-3-14

Chapter 7. DETERMINATIONS

Section 1. ISSUING DETERMINATIONS

7-1-1. POLICY

All known aeronautical facts revealed during the obstruction evaluation shall be considered when issuing an official FAA determination. The determination shall be a composite of all comments and findings received from interested FAA offices. Should there be a disagreement in the findings, the disagreement shall be resolved before issuance of a determination. The basis for all determinations shall be on the aeronautical study findings as to the extent of adverse physical or electromagnetic interference effect upon navigable airspace or air navigation facilities. Evidence of adverse effect alone, either physical or electromagnetic, is not sufficient justification for a determination of hazard. However, a finding of a substantial physical or electromagnetic adverse effect normally requires issuance of a determination of hazard.

7-1-2. RESPONSIBILITY

a. The regional ATD is responsible for issuing determinations.

b. However, if any division objects to a structure that does not exceed part 77 obstruction standards or have a physical or electromagnetic interference effect upon navigable airspace or air navigation facilities, the objecting division shall be responsible for issuing the determination. Examples would be:

1. Objections identifying potential airport hazards based on airport design criteria such as a structure within the runway protection zone (RPZ).

2. Objections identifying potential airport hazards such as structures which may not be above ground level (e.g., landfills, retention ponds, and waste recycling areas) but may create an environment that attracts birds and other wildlife.

7-1-3. CONFORMANCE TO POLICY

The FAA office that is responsible for issuing determinations shall ensure that each determination issued conforms to established policies, procedures, and guidelines.

Exceptional cases may require special handling, but no determination shall be issued which would be contrary to agency policy until the matter has been coordinated with and approved by the Program Director for Air Traffic Airspace Management, ATA-1.

7-1-4. DETERMINATIONS

Determinations issued by the FAA receive widespread public distribution and review. Therefore, it is essential that each determination issued is consistent in form and content to the extent practicable. To facilitate this and to achieve economy in clerical handling, automated correspondence is available through the OE/AAA automation program and shall be used in lieu of previously approved FAA forms. Determinations shall be issued as follows:

a. Issue a "Does Not Exceed" (automated DNE letter) determination if the structure does not exceed obstruction standards, does not have substantial adverse physical or electromagnetic interference effect upon navigable airspace or air navigation facilities, and would not be a hazard to air navigation.

NOTE-

A determination indicating that No Notice is Required (NNR) is no longer authorized.

b. Issue an "Exceeds But Okay" (automated EBO letter) determination if the structure exceeds obstruction standards but does not result in a substantial adverse effect, circularization was not necessary, and meets one of the following conditions:

1. The structure is temporary;

2. The structure is existing; or

3. The structure involves an alteration with no physical increase in height or change of location such as a proposed decrease in height or proposed side mount.

NOTE-

The significant difference between an EBO determination and a "Determination of No Hazard to Air Navigation" (DNH) is that the EBO determination does not allow for petition rights.

c. Issue a "Determination of Presumed Hazard" (automated DPH letter) if the structure exceeds obstruction standards and/or has an adverse effect upon navigable airspace or air

navigation facilities and resolution or further study is necessary to fully determine the extent of the adverse effect. The DPH facilitates negotiation and is useful in preserving navigable airspace. Normally, the FAA should not automatically initiate further study (including circularization) without a request to do so by the sponsor. The intent of the DPH determination is to stand as a final determination if the sponsor does not respond or if negotiation/resolution is not successful. If negotiation is successful, and resolution is achieved, or further study is completed, an appropriate subsequent determination should be issued.

d. Issue a "Determination of No Hazard" (DNH) if the structure exceeds obstruction standards but does not result in a substantial adverse effect.

e. Issue a "Determination of Hazard" (DOH) if the structure would have or has a substantial adverse effect; negotiations with the sponsor have been unsuccessful in eliminating the substantial adverse effect; and the affected aeronautical operations and/or procedures cannot be adjusted to accommodate the structure without resulting in a substantial adverse effect. The obstruction evaluation may or may not have been circularized.

7-1-5. DETERMINATION CONTENT AND OPTIONS

Use the following items, as appropriate, to ensure that the necessary information is included in each determination:

a. All non-hazard determinations shall address or include:

1. **FULL DESCRIPTION** - A full description of the structure, project, etc., including all submitted frequencies and ERP shall be included. Use exact information to clearly identify the nature of the project (e.g., microwave antenna tower; FM, AM, or TV antenna tower; suspension bridge; four-stack power plant; etc.).

2. **LATITUDE, LONGITUDE, AND HEIGHT** - Specify the latitude, longitude, and height(s) of each structure. When an obstruction evaluation study concerns an array of antennas or other multiple-type structures, specific information on each structure should be included.

3. **MARKING AND/OR LIGHTING** - A marking and/or lighting recommendation shall be a condition of the determination when aeronautical study discloses that the marking and/or lighting are necessary for aviation safety.

(a) If the OE notice was for an existing structure with no physical alteration to height or location (e.g., a side mount or an editorial correction to coordinates and/or elevations due to more accurate data), and the structure was previously studied, the recommended marking and/or lighting may be in accordance with the prior study.

(b) If the notice is for a new structure, a physical alteration (height/location) to an existing structure, or an existing structure that did not involve a physical alteration but was not previously studied, the recommended marking and/or lighting shall be in accordance with appropriate chapters of the current AC 70/7460-1, Obstruction Marking and Lighting.

(c) If the OE notice was for a change in marking and/or lighting of a prior study whether the structure exists or not yet built, the recommended marking and/or lighting shall be in accordance with appropriate chapters of the current AC 70/7460-1.

(1) If it is an existing FCC-licensed structure, and the requested marking and/or lighting change is recommended, notify the sponsor to apply to the FCC for permission to make the change. Use the following specific language: "If the structure is subject to the authority of the Federal Communications Commission, a copy of this letter shall be forwarded to them and application should be made to the FCC for permission to change the marking and/or lighting as requested." This language is available in the automated letters.

(2) If the marking and/or lighting change involves high intensity white obstruction lights on an FCC-licensed structure, the sponsor shall be notified that the FCC requires an environmental assessment. Use the following specific language: "FCC licensees are required to file an environmental assessment with the Commission when seeking authorization for the use of the high intensity flashing white lighting system on structures located in residential neighborhoods, as defined by the applicable zoning law."

(3) If it is an existing structure and the requested marking and/or lighting change is recommended, the sponsor shall be required to notify NACO directly when the change has been accomplished. Use the following specific language: "So that aeronautical charts and records can be updated, please notify National Aeronautical Charting Office (NACO) in writing (with a courtesy copy to the NFDC) when the new system is installed and operational. NACO notification should be addressed to: National Aeronautical Charting Office, Aeronautical Information Branch, Room 5601 N/ACC113, 1305 East-West Highway, Silver Spring, Maryland 20910."

(d) If it is determined that marking and/or lighting are not necessary for aviation safety, marking and/or lighting may be accomplished on a voluntary basis. However, marking and/or lighting should not be a condition of the determination. Instead, it shall be recommended that voluntary marking and/or lighting be installed and maintained in accordance with AC 70/7460-1. Use specific language as follows: "Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking and/or lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory Circular 70/7460-1."

4. SUPPLEMENTAL NOTICE - FAA Form 7460-2, Notice of Actual Construction or Alteration, Part 2, is the authorized form for sponsors to report the start, completion, or abandonment of construction, and the dismantlement of structures. Furnish this form to each sponsor when supplemental notice is required. Each ATD shall take action to insure that their return address is correct before sending the form to the sponsor.

(a) When deemed necessary, request sponsors to complete and mail Part 1 of FAA Form 7460-2, to be received at least 10 days before the start of construction or alteration, when:

(1) An aeronautical procedure or minimum flight altitude will be affected

(supplemental notice earlier than 10 days may be requested to permit adjustments);

(2) The construction will be in progress over an extended period of time; or

(3) The structure will exceed 500 feet AGL and will be erected within a relatively short period of time, as in the case of a TV tower.

(b) In addition, submission by the sponsor of FAA Form 7460-2, shall be required when the structure is a new construction or involves a proposed physical alteration, and:

(1) Is more than 200 feet above ground level;

(2) Is less than 200 feet above ground level (AGL) but exceeds obstruction standards, requires a change to an established FAA procedure or flight minimum, requires certified accuracy so as not to exceed minimums; or

(3) The FAA deems it necessary for any other reason.

(c) The information submitted on FAA Form 7460-2 is used for:

(1) Charting obstructions to air navigation on aeronautical charts;

(2) Giving notice to airmen, when applicable, of the construction of obstructions;

(3) Changing affected aeronautical procedures and operations;

(4) Revising minimum flight altitudes; and

(5) Updating the NACO Obstacle Digital File.

(d) Do not require supplemental notice for existing structures that do not involve a proposed physical alteration. Instead, directly communicate the known information to NACO and other relevant persons or organizations, as necessary.

5. EXPIRATION DATE - Include an expiration date, if applicable.

(a) Assign an expiration date to all determinations that involve new construction or alterations.

(1) Normally all determinations, whether FCC construction permit related or not, shall be assigned an expiration date 18 months from the effective/issued date. In the case of determinations involving petition rights, the expiration shall be 18 months from the final date of the determination.

(2) If circumstances warrant, an expiration date not to exceed 18 months should be assigned.

(b) The determination expires on the date prescribed unless:

(1) Extended, revised, or terminated by the issuing office; or

(2) The construction is subject to the licensing authority of the FCC and an application for a construction permit has been filed as required by the FCC within 6 months of the date of the determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application. A request for extension must be postmarked or delivered at least 15 days prior to expiration.

(c) If the date of a final determination is changed because of a petition or review, a new expiration date will be specified as appropriate.

(d) Determinations involving existing structures that do not involve a proposed physical alteration shall not contain an expiration date.

6. SPECIAL CONDITIONS - Any condition upon which a no hazard determination is based shall be specified in the determination. When FAA Form 7460-2 is requested, a condition of the determination will be for the sponsor to keep the FAA informed of the project's status. Use the following specific language: "As a result of this structure being critical to flight safety, it is required that the FAA be kept informed as to the status of the project. Failure to respond to periodic FAA inquiries could invalidate this determination."

7. SPECIAL STATEMENTS - To help prevent potential problems, all determinations shall include the following statements:

(a) "This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies), and power. Any change in coordinates, heights, frequency(ies), or use of greater power will void this determination. Any future construction or alteration, including increase in heights, power, or the addition of other transmitters, requires separate notice to the FAA."

(b) "This determination does include temporary construction equipment, such as cranes, derricks, etc., which may be used during the actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA."

(c) "This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, state, or local government body."

8. ADVISORIES - Determinations may require advisory statements (available in the automated letters) to notify sponsors of potential issues.

(a) Issues pertaining to noise can be addressed as a statement in the determination with the following language: "The structure considered under this study lies in proximity to an airport and occupants may be subjected to noise from aircraft operating to and from the airport."

(b) When requested by the military, issues pertaining to military training areas/routes can be addressed in a determination with the following language: "While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route."

(c) Issues pertaining to a runway protection zone can be addressed in the determination as follows: "While the structure does not constitute a hazard to air navigation, it

would be located within the Runway Protection Zone (RPZ) of the airport/runway. Structures, which will result in the congregation of people within an RPZ, are strongly discouraged in the interest of protecting people and property on the ground. In cases where the FAA can control the use of the property, such structures are prohibited. In cases where the FAA exercises no such control, advisory recommendations are issued to inform the sponsor of the inadvisability of the project from the standpoint of safety to personnel and property.”

b. In addition to the above items, a DNH shall also include or address:

1. Obstruction standards exceeded;
2. Effect on VFR/IFR aeronautical departure/arrival and en route operations, procedures, and minimum flight altitudes;
3. Effect on existing public-use airports and aeronautical facilities;
4. Effect on all planned public-use airports and aeronautical facilities;
5. Cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures;
6. Information and comments received as a result of circularization, informal airspace meetings, and negotiations;
7. Reasons and basis for the determination that the structure will not be a hazard to air navigation and any accommodations necessary by aeronautical users or sponsors;
8. Consideration given to any valid aeronautical comments received during the aeronautical study. The official FAA determination shall be a composite of the comments and findings received from other interested FAA offices;
9. Conditions of the determination, including recommendations for marking and/or lighting of a structure, and changes in procedures and/or altitudes that are necessary to accommodate the structure. The “conditions” should include a statement that appropriate action will be taken to amend the effected procedure(s) and/or altitude(s) upon notification

to the FAA by the sponsor prior to the start of construction or alteration;

10. Limitations, if any; and

11. Petitioning information regardless of whether the structure is proposed or existing using the following specific language: “This determination is subject to review if an interested party files a petition on or before (30 days from issued date). In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace and Rules Division, ATA-400, Federal Aviation Administration, Washington, DC 20591. This determination becomes final on (40 days from issued date) unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review.”

c. A DOH shall include or address:

1. FULL DESCRIPTION - A full description of the structure, project, proposal, etc., including all submitted frequencies and ERP, shall be included. Use exact information to clearly identify the nature of the project. Use wording, such as microwave antenna tower, FM or AM antenna tower, suspension bridge, TV antenna tower, or four-stack power plant.

2. LATITUDE, LONGITUDE, AND HEIGHT- Specify the latitude, longitude, and height(s) of each structure. When an obstruction evaluation study concerns an array of antennas or other multiple-type structures, specific information on each structure should be included.

3. BASIS FOR THE DETERMINATION - The reasons and basis for the determination must include the adverse effect of the proposal upon the safe and efficient use of the navigable airspace by aircraft, and upon air navigation facilities. Also, state the reasons the affected aeronautical operations, or the procedure, cannot be adjusted to alleviate or eliminate the conflicting demands for the airspace. As a minimum, the determination shall address the following:

- (a) Obstruction standards exceeded;

(b) The effect on VFR/IFR aeronautical departure/arrival and en route operations, procedures, and the minimum flight altitudes effect on existing public-use airports and aeronautical facilities;

(c) The effect on all planned public-use airports and aeronautical facilities on file with the FAA, or for which the FAA has received adequate notice;

(d) The cumulative impact resulting from the proposed construction, or alteration of a structure when combined with the impact of other existing or proposed structures;

(e) Information and comments received as a result of circularization, informal airspace meetings, and negotiations; and

(f) Reasons and basis for the determination as to why the structure would be a hazard to air navigation (e.g., a clear showing of substantial adverse effect).

4. PETITIONING INFORMATION - Include petitioning information, regardless of whether the structure is proposed or existing, using the following specific language: "This determination is subject to review if an interested party files a petition on or before (30 days from issued date). In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace and Rules Division, ATA-400, Federal Aviation Administration, Washington, DC 20591. This determination becomes final on (40 days from issued date) unless a petition is timely filed. The determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review."

7-1-6. DETERMINATION DATES

a. ISSUED DATE - The issuance date of a determination is the date the determination is distributed.

b. PETITION DEADLINE - For determinations that involve petition rights, the deadline for receipt of petition shall be 30 days from the date of issuance.

c. EFFECTIVE DATE -

1. The effective date of determinations that do not involve petition rights shall be the date of issuance.

2. The effective date of determinations that involve petition rights, whether for existing or proposed structures, shall be 40 days from the date of issuance, provided a petition for review is not filed. If a petition for review is filed, the determination will not become final pending disposition of the petition.

NOTE-

The effective date and the issued date may or may not be the same. The effective date may also be referred to as the final date.

7-1-7. EXISTING STRUCTURES

A determination issued as a result of the study of an existing structure may be written in the following forms:

a. As a DOH or DNH;

b. As a formal letter outlining the effects of the structure and perhaps recommending to the sponsor that the structure, be marked and/or lighted, specifying that it be reduced in height, or specifying that it be removed;

c. As an informal letter or staff study making an internal FAA recommendation; or

d. As a formal letter to the FCC recommending the dismantling of an abandoned tower.

7-1-8. DISTRIBUTION OF DETERMINATIONS

A record of the distribution for each determination whether original, revised, extended, or affirmed shall be maintained in the aeronautical study file. When appropriate, a reference to the distribution code, a mailing list, or any other evidence of distribution will be sufficient.

a. Copies of all determinations shall be sent to the:

1. Sponsor (with FAA Form 7460-2 as necessary);

2. Sponsor's representative (if any);

3. FCC (if the structure is subject to its licensing authority);

4. NACO in lieu of FAA Form 7460-2 (if the structure is existing and does not involve a proposed physical alteration). Copies of the determination shall always be accompanied by a copy of the submitted map and, if applicable, a copy of the survey; or if the determination involves a change to marking and/or lighting of an existing structure for which the sponsor has been requested to notify NACO directly of the change. Copies of the determination shall always be accompanied by a copy of the

submitted map and, if applicable, a copy of the surveys; and

5. Other persons, offices, or entities as deemed necessary or as requested.

b. In addition to the above distribution, copies of a DNH and DOH shall also be sent to:

1. ATA-400;
2. NACO;
3. Military representatives; and
4. All other interested persons.

Chapter 18. CLASS E AIRSPACE

Section 1. GENERAL

18-1-1. INTRODUCTION

Class E airspace consists of general controlled airspace.

NOTE-

Class E airspace surface areas are designated in Order 7400.9. Airspace designated as E-2, E-3, and E-4 must meet the criteria in Chapter 17 of this order

18-1-2. PURPOSE

a. A surface area is designated to provide controlled airspace for terminal instrument operations and extends upward from the surface to a designated altitude; or to the adjacent or overlying controlled airspace.

b. If the communication and weather requirements described in paragraphs 17-2-9 and 17-2-10 are met, Class E2 airspace should be designated to accommodate:

1. IFR arrival, departure, holding, and en route operations not protected by other controlled airspace.

2. Instrument approach procedures.

3. Special Instrument approach procedures.

18-1-3. DESIGNATION

If the communications and weather observation reporting requirements of paragraphs 6102 and 6103 are met, a surface area:

a. Should be designated where an FAA control tower is in operation.

b. May be designated where a non-FAA control tower is in operation.

c. May be designated to accommodate instrument procedures (prescribed, special, arrival, departure) if such action is justified and/or in the public interest. The following factors are among those that should be considered:

1. Type of procedure including decision height or minimum descent altitude.

2. The actual use to be made of the procedure, including whether it is used by a certificated air carrier or an air taxi/commuter operator providing service to the general public.

NOTE-

For special instrument procedures, consideration should be given to availability to other users.

3. The operational and economic advantage offered by the procedure, including the importance and interest to the commerce and welfare of the community derived by the procedure.

4. Any other factors considered appropriate.

level of use in such areas. In these cases, the airspace proposal package must include specific justification of why joint-use is not appropriate.

c. Joint-use does not apply to prohibited areas. Alert areas and CFAs are essentially joint-use because nonparticipating aircraft may transit these areas without limitation.

d. Joint-use procedures shall be specified in a joint use "Letter of Procedure" or "Letter of Agreement" between the using agency and the controlling agency. These letters should include provisions for the real-time activation/deactivation of the airspace, where such capabilities exist. They should also provide for the timely notification to the controlling agency when the scheduled activity has changed, been canceled, or was completed for the day.

e. Using agencies shall ensure that joint-use SUA is returned to the controlling agency during periods when the airspace is not needed nor being used for its designated purpose.

21-1-9. ENVIRONMENTAL ANALYSIS

a. SUA actions, except as listed in paragraph b. below, are subject to environmental impact analysis in accordance with the National Environmental Policy Act of 1969 (NEPA). Guidance for the environmental analysis of SUA proposals is contained in FAA Order 1050.1, Policies for Considering Environmental Impacts, other relevant FAA directives; the FAA/DoD Memorandum of Understanding Concerning Special Use Airspace Environmental Assessment; and other applicable regulations and statutes.

b. Prohibited area and alert area designations are actions that are neither permissive nor enabling. As such, environmental assessments or statements are not required when designating these areas (see FAA Order 1050.1).

21-1-10. CONTROLLING AGENCY

The controlling agency is the FAA ATC facility that exercises control of the airspace when an SUA area is not activated. A military ATC facility may be assigned as the controlling agency, subject to the concurrence of the regional ATD and the concerned ARTCC. A controlling agency shall be designated for each joint-use SUA area.

21-1-11. USING AGENCY

a. The using agency is the military unit or other organization whose activity established the requirement for the SUA. The using agency is responsible for ensuring that:

1. The airspace is used only for its designated purpose.

2. Proper scheduling procedures are established and utilized.

3. The controlling agency is kept informed of changes in scheduled activity, to include the completion of activities for the day.

4. A point of contact is made available to enable the controlling agency to verify schedules, and coordinate access for emergencies, weather diversions, etc.

REFERENCE-

Order 7610.4, Chapter 9, Military Operations Requirements.

b. Restricted area and MOA using agencies are responsible for submitting Restricted Area/MOA Annual Utilization Reports in accordance with Section 7 of this chapter.

c. An ATC facility may be designated as the using agency for joint-use areas when that facility has been granted priority for use of the airspace in a joint-use letter of procedure or letter of agreement.

21-1-12. WAIVERS

The establishment of SUA does not, in itself, waive compliance with any part of the Code of Federal Regulations. DoD has been granted a number of waivers, exemptions, and authorizations to accomplish specific missions. Information about current waivers, exemptions, and authorizations granted for military operations may be obtained from FAA Headquarters, Airspace and Rules Division, ATA-400 or the Office of Rulemaking (ARM).

21-1-13. PUBLIC NOTICE PROCEDURES

Public notice procedures invite the public to comment on the impact of SUA proposals on the safe and efficient use of the navigable airspace. In addition to the public notice procedures described in chapter 2 of this order, SUA proposals are subject to the following:

a. All nonregulatory SUA proposals shall be circularized, and an NPRM shall be issued for all

Section 2. PROCESSING

22-2-1. PROPOSALS

a. Submit prohibited area proposals to the regional ATD for processing in accordance with the requirements in Chapter 21 of this Order. Although specifying a minimum processing time is impractical, at least 6 months would be needed for a routine, non-controversial proposal.

b. The restrictions imposed by a prohibited area may be highly controversial and require in-depth study as well as strong justification.

22-2-2. REGIONAL ACTIONS

After completing the requirements of Chapter 21, prohibited area proposals shall be forwarded to ATA-400 for final determination.

Chapter 26. ALERT AREAS

Section 1. GENERAL

26-1-1. DEFINITION

An alert area is airspace wherein a high volume of pilot training or an unusual type of aeronautical activity is conducted.

26-1-2. PURPOSE

Alert areas are designated to inform nonparticipating pilots of areas that contain a high volume of pilot training operations, or an unusual type of aeronautical activity, that they might not otherwise expect to encounter. Pilots are advised to be particularly alert when flying in these areas.

26-1-3. LOCATION

Alert areas shall not extend into Class A, B, C, and D airspace, or Class E airport surface areas. To the extent possible, alert areas should avoid Federal airways, major terminal areas, and high volume VFR routes. Once an alert area is designated the establishment of Federal airways through such areas should be kept to a minimum.

26-1-4. ACTIVITIES

a. Only those activities that do not pose a hazard to other aircraft may be conducted in an alert area.

b. All alert area activities shall be conducted in accordance with visual flight rules, and in compliance with applicable Sections of 14 CFR.

c. Flight Service Stations may broadcast information regarding alert area activities as circumstances dictate.

26-1-5. IDENTIFICATION

Alert areas shall be identified by the letter "A" prefix followed by a dash, a two or three digit number, a location, and the two-letter state abbreviation (e.g., A-292 Pensacola, FL). A letter suffix is used to indicate subdivisions. Identification numbers are assigned by ATA-400. Aeronautical charts shall be annotated to reflect the type of activity conducted in the alert area.

Part 6. MISCELLANEOUS PROCEDURES

Chapter 28. OUTDOOR LASER OPERATIONS

Section 1. GENERAL

28-1-1. PURPOSE

This chapter prescribes policy, responsibilities, and guidelines for processing outdoor laser operation requests and determining the potential effect of outdoor laser activities on users of the NAS.

28-1-2. AUTHORITY

a. Title 49 of the U.S. Code (49 U.S.C.) Section 40103 gives the Administrator the authority to regulate, control, develop plans for, and formulate policies with respect to the use of the navigable airspace.

b. Regulatory authority for laser light products has been delegated to the Food and Drug Administration (FDA). Product regulations are detailed in 21 CFR part 1010, Performance Standards for Electronic Products, and part 1040, Performance Standards for Light Emitting Products.

28-1-3. POLICY

a. Determinations shall be based on the findings of an aeronautical review.

b. Regional offices shall conduct an aeronautical review of all laser operations to be performed in the NAS to ensure that these types of operations will not have a detrimental effect on aircraft operations. Requests should be evaluated by the region having jurisdiction over the airspace and coordinated, if necessary, with the affected facility.

c. Full consideration shall be given to national defense requirements, commercial uses, and general aviation operations that have the public right of "freedom of transit" through the NAS.

d. Accordingly, while a sincere effort shall be made to negotiate equitable solutions to conflicts over the use for non-aviation purposes, preservation of the navigable airspace for aviation must receive primary emphasis.

28-1-4. RESPONSIBILITIES

a. The regional ATD or designee is responsible for evaluating and determining the effect of outdoor laser operations on users of the navigable airspace.

b. Flight Standards (AFS) is responsible for providing information regarding activities that have the potential effect placed upon the pilot in the performance of his duties.

c. Aviation Medicine is responsible for providing information regarding the potential effects of laser lights on pilot vision.

28-1-5. DEFINITIONS

a. Afterimage - A reverse contrast shadow image left in the visual field after an exposure to a bright light that may be distracting and disruptive, and may persist for several minutes.

b. Center for Devices and Radiological Health (CDRH) - An office of the FDA concerned with enforcing compliance with the Federal requirements for laser products including laser light shows.

c. Demonstration - Any laser product designed or intended for purposes of visual display of laser beams, for artistic composition, entertainment, and/or advertising display (Reference 21 CFR 1040.10(b) 13).

d. Divergence - The increase in diameter of the laser beam with distance from the exit aperture (sometimes referred to as beam spread).

e. Flashblindness - Generally, a temporary visual interference effect that persists after the source of illumination has ceased.

f. Flight Safe Level - An estimate of the maximum exposure of radiant light energy emission (irradiance value) allowed to illuminate an aircraft within specific flight zones.

g. Flight Zones - Airspace areas specifically intended to mitigate the potential hazardous effect of laser emissions. There are several

types of flight free zones which may not be contiguous or concentric. See FIG 28-1-1, FIG 28-1-2, and FIG 28-1-3.

h. Flight Zone Exposure Distance - The maximum distance from the laser system beyond which the laser beams irradiance level does not exceed a specific level:

1. Laser Free Zone - 50nW/cm^2 ;
2. Critical Zone - $5\mu\text{W/cm}^2$;
3. Sensitive Zone - $100\mu\text{W/cm}^2$.

i. Irradiance - Irradiance is a means of expressing the intensity of the beam. Generally, the power per unit area expressed in watts per centimeter squared.

j. Joule (J) - The international system unit of energy. One joule equals one watt times one second.

k. Laser - An acronym for light amplification by stimulated emission of radiation. A laser is a device that produces an intense, directional, coherent beam of visible or invisible light.

1. Continuous Wave (CW) The output of a laser which is operated in a continuous duration rather than a pulsed mode.

2. Repetitive Pulsed (RP) A laser with multiple pulses of radiant energy occurring in a sequence.

l. Laser Manufacturer - A term that refers to persons who make laser products, including those who are engaged in the business of design, assembly, or presentation of a laser light show.

m. Laser Operator - A knowledgeable person present during laser operation who has been given authority to operate the laser system in compliance with applicable safety standards, subject to recommendations of the laser safety officer.

n. Laser Safety Officer (LSO) - Anyone who has authority to monitor and enforce the control of laser hazards and affect the knowledgeable evaluation and control of laser hazards.

o. Laser Safety Observer - Anyone who is responsible for monitoring the safe operation of a laser and can affect termination of the laser

emission in the event an unsafe condition is imminent.

p. Local Laser Working Group (LLWG) - A group that, when necessary, is convened to assist the regional ATD in evaluating the potential effect of laser emissions on aircraft operators in the local vicinity of the proposed laser activity.

q. Maximum Permissible Exposure (MPE) - The level of laser radiation to which a person may be exposed without hazardous effect or adverse biological change in the eye or skin. In general, MPE is expressed as mW/cm^2 or mJ/cm^2 .

r. Milliradian (mrad) - A measure of angle used for beam divergence.

s. Nominal Ocular Hazard Distance (NOHD) - The maximum distance from the laser system beyond which the laser-beam irradiance does not exceed the MPE for that laser.

t. Radiant Exposure - A means of expressing the intensity of the beam. This is generally expressed as J/cm^2 .

u. Reflected Beams -

1. Diffuse - "Change of the spatial distribution of a beam of radiation when it is reflected in many directions by a surface or by a medium. Some examples of this are flat finish paints or rough surfaces."

2. Specular - A mirror-like reflection that usually maintains the directional characteristics of the beam.

v. Terminated Beam - An output from the laser projector that enters navigable airspace that is confined by an object that blocks the beam or prohibits the continuation of the beam at levels above the applicable flight safe level.

w. Unterminated Beam - A laser beam that is directed or reflected into the navigable airspace.

x. Variance - Permission from FDA for a laser manufacturer and/or operator to deviate from one or more requirements of 21 CFR 1040 when alternate steps are taken to provide equivalent level of safety.

y. Watt - A unit of measurement associated with power output. Often the wattage of a laser system is prefixed with milli (mW), micro (μW), or nano (nW). One watt is one joule per second.

Section 2. EVALUATING AERONAUTICAL EFFECT

28-2-1. AERONAUTICAL REVIEW

a. At a minimum the following items shall be studied as part of any aeronautical review:

1. Location of the proposed operation.
2. Aircraft operations affected by the proposed operation.
3. Air traffic flows in the proposed area of the operation.
4. ATC facility having control over the affected airspace.
5. As part of the review, plot any effected airports "LFZ, CFZ, and SFZ." In addition, evaluate any control measures which may mitigate the effects.

NOTE-

The LFZ, CFZ, and SFZ need only be considered for visible laser systems.

6. The irradiance levels listed below shall be adhered to when evaluating laser activities in close proximity to an airport. In addition, laser light shall not be allowed to enter these zones if irradiance values exceed these limits.

(a) A laser-free zone is equal to or less than 50 nW/cm².

(b) A critical flight zone is equal to or less than 5 μW/cm².

(c) A sensitive flight zone is equal to or less than 100 μW/cm².

(d) A normal flight zone is equal to or less than the MPE.

EXCEPTION-

"When control measures (i.e. visual observers) mitigate any issues raised by the aeronautical review, irradiance levels may exceed these numbers."

b. Consult FDA/CDRH personnel for technical advice. (e.g. rp calculations)

c. Scientific/research (SR) lasers in accordance with 21 CFR Section 1010.5 may be exempt from Title 49 and, in addition, may not be able to comply with the above procedures. Regardless of whether or not a proponent is exempt from the provisions, when a proposal is received follow the above procedures.

28-2-2. LOCAL LASER WORKING GROUP (LLWG)

When necessary, the ATD may convene a LLWG to assist in evaluating proposed local laser activities when it is determined such a need exists.

a. The ATD shall forward information on a proposed outdoor laser activity to the local AT facility.

b. The local AT facility shall act as the focal point for the LLWG. Other participants may include, but not limited to, representatives from the center, "non-federal" towers, airport management, airspace users, city/county/state officials, other government agencies, military representatives, qualified subject experts, laser manufacturers, etc.

c. The LLWG shall resolve issues regarding local laser operations and forward recommendations to the ATD office as soon as practicable.

28-2-3. LASER SYSTEM POWER RANGE TABLE

The laser system power range tables (TBL 28-2-1 and TBL 28-2-2) shall only be applied to continuous wave laser systems. Proponents are required to resolve RP laser system calculations with the FDA, laser manufacture, or by submitting a completed Laser Configuration Worksheet prior to requesting determination by the FAA.

a. TBL 28-2-1 specifies the minimum distance from the laser source (for 1 mrad divergence) which should be protected horizontally from the laser source.

b. TBL 28-2-2 specifies the minimum distance from the laser source (for 1 mrad divergence) which should be protected vertically from the laser source.

c. The minimum altitude may be determined by multiplying the laser distance from TBL 28-2-1 by the sine of the angle of elevation

of the laser beam from TBL 28-2-2. For example, $\text{Altitude} = \text{Laser Distance} \times \text{Sine} = (\text{maximum elevation angle})$.

d. The minimum horizontal distance may be determined by multiplying the laser distance from TBL 28-2-1 by the cosine of the angle of elevation of the laser beam from TBL 28-2-2. For example, $\text{Horizontal Distance} = \text{Laser Distance} \times \text{Cosine} = (\text{minimum elevation angle})$.

e. Do not reduce calculated distances for techniques incorporated by the manufacturer unless validated by FDA/CDRH.

f. All distances shall be rounded up to the next 100-foot increment. See example problems 1, 2, and 3 that follow the Laser System Power Range Table, TBL 28-2-1.

28-2-4. CONTROL MEASURES

Physical, procedural, and automated control measures that ensure aircraft operations will not be exposed to levels of illumination greater than the respective maximum irradiance levels established by the MPE, LFZ, CFZ, and SFZ.

a. Physical beam stops at the system location or at a distance used to prevent laser light from being directed into protected volumes of airspace.

b. Adjusting the beam divergence and output power emitted through the system aperture to meet appropriate irradiance $\mu\text{W}/\text{cm}^2$ distance.

c. Beams can be directed in a specific area. Directions should be specified by giving bearing in the azimuth scale 0-360 degrees and elevation in degrees ranging from 0-90 degrees, where zero degrees is horizontal and 90 degrees is vertical, bearings shall be given in both true and magnetic north.

d. Manual operation of a shutter or beam termination system can be used in conjunction with airspace observers. Observers shall be able to see the full airspace area surrounding the beam's paths to a distance appropriate to the affected airspace.

e. Scanning of a laser system that are designed to automatically shift the direction of the laser emission can be used. However, scanning safeguards must have safeguards acceptable by the FDA and the FAA. The FDA recommendation must be included in the proposal to the FAA.

NOTE-

Scanning may reduce the level of illumination; however, it may also increase the potential frequency of an illumination.

f. Automated systems designed for use to detect aircraft and automatically terminate, redirect the beam, or shutter the system, must be acceptable to the FAA before the device may be accepted as a control measures which satisfies as an equivalent level of safety.