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Identification and Characterization of Elements for an Air Force Range Planning Document

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NOVEMBER 1977

FINAL REPORT FOR PERIOD SEPTEMBER 1977-DECEMBER 1977

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CIVIL AND ENVIRONMENTAL
ENGINEERING DEVELOPMENT OFFICE
(AIR FORCE SYSTEMS COMMAND)
TYNDALL AIR FORCE BASE
FLORIDA 32403

NOTICE

REQUEST FOR COMMENTS

CEEDO-TR-77-52, IDENTIFICATION AND CHARACTERIZATION OF ELEMENTS FOR AN AIR FORCE RANGE PLANNING DOCUMENT.

This report is the first report in a range planning study which is expected to continue through June 1979. Your comments on the proposed elements, the concept of range planning, and issues faced by our air-to-ground ranges are solicited. Please mail comments to:

DET 1 ADTC/ECA
(Capt Donald J. Armstrong, Jr)
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or Call

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report identifies and characterizes those elements which should be included in range planning documents which may be prepared for air-to-ground ranges. The report identifies nine major elements with each having from three to six subelements. The discussion on each element includes:

a. Characterization;
b. Rationale;
c. Use of Element at Various Levels of Command; and

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d. Outline of Subelements.

This report will be used during a follow-on range planning effort in Land-Use Planning and Compatible Use Zones.

PREFACE

This report was prepared by Woodward-Clyde Consultants, San Francisco CA 94111, under Contract Number F08635-76-D-0134, Delivery Order 0004, with Eglin AFB FL. This report summarizes work done between September 1977 and December 1977. Captain Donald J. Armstrong, Det 1 ADTC/ECA, was project officer.

This report has been reviewed by the Information Office and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nations.

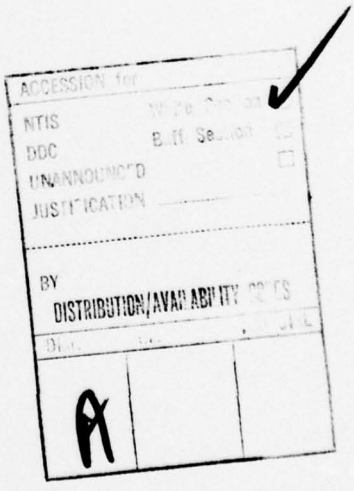
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TABLE OF CONTENTS

Section	Title	Page
I	SUMMARY	1
II	IDENTIFICATION AND CHARACTERIZATION OF AN AIR FORCE RANGE PLANNING DOCUMENT	4
	Introduction	4
	Objective	8
III	STUDY METHODOLOGY, ANALYSES, AND FINDINGS	9
	Methodology	9
	Analyses	11
	Findings	12
	Proposed Major Range Planning Elements	14
	Needs and Requirements for Range Planning Documents at Various Levels of Command, and at Non-DoD Agencies	15
IV	IDENTIFICATION OF RANGE PLANNING ELEMENTS	17
	Introduction	17
	Range Missions	20
	Range Instrumentation and Support Facilities	24
	Range Land Requirements	28
	Range Airspace Requirements	32
	Natural Resources Context	36
	Community/Governmental Context	42
	Legal/Legislative Context	47
	Range Administration	52
	Range Operations	56
V	CURRENT AIR FORCE RANGE PLANNING PROGRAMS	65
	Range Compatible Use Zone (RACUZ) Program	66
	Comprehensive Range Planning	67
	Current Air Force Programs Related to the Proposed Range Planning Elements	68

		Page
APPENDIX A	LIST OF INDIVIDUALS INTERVIEWED AND BRIEFED AS PART OF THIS STUDY	71
APPENDIX B	LIST OF DOCUMENTS REVIEWED	75
APPENDIX C	GLOSSARY OF KEY TERMS	83

LIST OF FIGURES

Figure	Title	Page
1	Methodology Framework for Base Comprehensive Plans	13

LIST OF TABLES

Table	Title	
1	Summary Listing of Range Planning Elements and Subelements	19

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SECTION I

SUMMARY

This report describes a study of Air Force air-to-ground ordnance delivery ranges performed by Woodward-Clyde Consultants during the fall of 1977. The objective of the study is to identify those elements that must be addressed in establishing an Air Force Range Planning Document. The purpose of the Range Planning Document is to define and support land and airspace requirements for air-to-ground ordnance delivery ranges used in support of military training and weapons systems development. The elements identified in this initial task will be used in the development of an Air Force range planning methodology and handbook to be completed and tested during FY 78 and 79.

A major portion of this study included field visits to ranges and interviews with range personnel and with non-DoD representatives having range-related responsibilities. In addition, Air Force documents and studies have been reviewed and analyzed.

Evaluation of the information gathered during this study has produced the following findings related to Air Force range planning and to the elements that should be included in a Range Planning Document.

1. Air Force ranges are indispensible elements of Air Force mission effectiveness, and are essential for air crew training, for testing new weapons systems, and for defense preparedness.

2. Current and future Air Force range missions may be seriously constrained by land and air space encroachments, environmental legislation, public demands for use of ranges, constraints by landowners, budget limitations, and the requirements of new weapons systems.

3. Clear scientific evidence may be needed to comply with applicable laws and to justify the continued withdrawal of its large range areas from the public domain.

4. The Range Compatible Use Zones (RACUZ) program could be extremely useful in defending Air Force range missions.

5. Currently little standardized Air Force guidance is available to Range Managers on developing comprehensive plans for their ranges.

6. A large number of diverse needs and requirements are involved in range operations and planning, including new requirements derived from environmental legislation and the incorporation of new systems for mission operations.

7. Many of these needs and requirements are currently being met by Air Force range personnel, but often in an incremental manner that lacks coordination and continuity with other requirements, leading to inefficiencies in range operations and causing difficulties in planning and decision making.

8. A planning process that considers all of the range planning factors together, particularly including environmental and community factors, and resolves differences among them, is essential to long-term, efficient, and timely range operation.

9. Each level of command (HQ USAF, MAJCOM, Base, and Ranges) as well as non-DoD agencies, has differing needs and requirements for range planning documents.

10. Range planning elements should parallel Base Comprehensive Planning methodology currently being developed.

11. Range planning elements will provide the basic input into the range planning process by defining the objectives, existing conditions, and future needs and requirements of each range.

12. Evaluation of the information on Air Force range operations provided by this study suggests the following Major Range Planning Elements:

    a. Range missions
    b. Range instrumentation and support facilities
    c. Range land requirements
    d. Range airspace requirements
    e. Natural resources context
    f. Community/governmental context
    g. Legal/legislative context
    h. Range administration
    i. Range operations

13. Each of these elements is characterized by a series of subelements that identify objectives, existing conditions, and future requirements.

14. Elements a, c, and d define Air Force mission requirements for range land and airspace.

15. Elements h and i describe the management and operation of ranges.

16. Elements d, e, f, and g describe competing and compatible uses of range lands and airspace.

17. Each of the range elements, by its nature, is closely interrelated with, and dependent on, each of the other elements.

18. The Air Force currently has many on-going programs that will serve as a valuable foundation for the development of a comprehensive range planning process, such as RACUZ, air field and airspace criteria programs described in AFM 86-8, natural resources management programs as described in AFM 126-1, real property management programs as described in the AFR 87 series, and others.

SECTION II

IDENTIFICATION AND CHARACTERIZATION OF AN AIR FORCE RANGE PLANNING DOCUMENT

1. INTRODUCTION

a. Background

In September of 1977, the U.S. Air Force commissioned Woodward-Clyde Consultants to identify and characterize the elements for an Air Force Range Planning Document.[a] The elements identified in this intial task will form the basis for an Air Force range planning methodology and handbook to be prepared under subsequent contracts.

The major components of the overall program will be:

- A range planning methodology - "What To Do."
- A range planning handbook - "How To Do It."

The total program leading to an Air Force Range Planning Handbook includes the following steps:

Task	
1.	Identification and characterization of elements for a Range Planning Document.
2.	Preparation of a range planning methodology.
3.	Preparation of a handbook for Air Force range planning.

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[a]Contract FO 8635-76-D-0-134, DO No. 0004.

4. Application and validation of the range planning methodology and handbook using the Air Force Flight Test Center Precision Impact Range (PIRA), Edwards Air Force Base, California, as a test case. An environmental assessment or an environmental impact statement (EIS), as appropriate, will be prepared during this validation process.

5. Refinement and further development of the methodology and handbook based on the Edwards Air Force Base validation, and the development of an implementation plan for integrating the Range Planning Document into the range planning process.

b. Statement of Problem

Air Force air-to-ground ordnance delivery ranges are critical components of overall Air Force mission effectiveness. These ranges are essential for effective air crew training and for testing and evaluating new weapons systems. In addition, the ranges are valuable to other DoD agencies and in general terms of national defense preparedness.

However, use of many existing Air Force ranges is currently under serious constraint because of land and airspace encroachments; requirements of national environmental legislation (rare and endangered species, archaeological resources, etc.); competing demands for the range lands (recreation, mining, grazing, forestry, off-road vehicles (ORVs), etc.); differences and sometimes conflicts with local communities about the way the Air Force uses range lands; limitations placed by landowners on Air Force use of range lands and airspace; and finally because Air Force needs for range lands and airspace are likely to continue to increase as faster and more sophisticated weapons systems are developed.

In compliance with applicable laws, the Air Force may soon be required to present evidence in support of its need for the vast land areas that comprise its testing and training ranges. Much of this land is currently in the public domain (BLM land withdrawals, etc). Evidence of this need in terms of safety, noise, ballistics, and other factors will be valuable for this purpose. Concurrently, the effect of this information on the mission capabilities of the smaller "back yard" ranges now in use by the Air Force may be significant to their continued use.

Both the on-going Range Compatible Use Zone (RACUZ) program, with its descriptors of accidents, noise and ballistics "footprints," and the products of this range planning program can be useful tools in the defense of Air Force ranges.

c. Comprehensive Planning

The study will include a comprehensive planning approach to deal with the above problems. The approach is based on the following:

- The present mission can be conducted most efficiently if all pertinent needs and requirements are considered simultaneously.
- Funding priorities can be justified most clearly and implemented most effectively when a comprehensive plan is available to guide the setting of priorities.
- Current missions can be continued with least cost and delay when pressing problems of environmental legislation, off-base development, and airspace use integration are clearly identified, and if procedures for dealing with them are implemented at the earliest possible time.
- Range lands and airspace will be suitable for future missions only if changes affecting range needs have been anticipated. This can be done on the basis of existing and projected mission needs, and on experience with past changes of mission in coordination with the FAA and other regulatory agencies.
- Differences in the requirements for the testing of the total weapon and/or air vehicle operating envelope versus training "footprints" must be recognized in the range planning process.
- Comprehensive and long-range planning are essential for integrating present and planned programs based on the present mission and on anticipated requirements of expected future missions.

Current Air Force range planning practices can be described as taking the "master planning" approach; that is, that they emphasize physical elements (targets, buffer areas, airspace requirements, etc.). Currently, no Air Force guidance is available to Range Managers on performing comprehensive planning - e.g., no procedures exist that encompass at one time all of the factors involved in range operation. The complete list of important factors is quite long and includes both factors that are currently handled efficiently by the Air Force as well as new factors

such as environmental issues that have gained major importance quite recently. Examples of these planning factors include:

Air space requirements

Operations

System Safety

Natural resources

Environmental concerns

Security

Intergovernmental/interagency coordination

Community concerns

Noise

Future mission needs

Socioeconomic impacts

Recreation potential

Water and mineral rights

Visual and other aesthetic resources

Leases, withdrawals, and land ownership

Project implementation and funding

Command decision-making processes

Range management continuity

A planning process that considers all of these factors together and resolves differences among them at the planning stage is essential to long-term efficient and timely range operation. The primary purpose of the Range Planning Handbook is to provide this integrative planning process.

The Range Planning Handbook will include a comprehensive planning methodology that integrates these and other range planning issues into

a range planning and management system for use by Air Force Range Managers and Commanders. The Range Planning Handbook will describe a step-by-step procedure for the development of a comprehensive plan, or Range Planning Document, for each Air Force range.

The Range Planning Document (RPD) will be prepared through the comprehensive process presented in the Range Planning Handbook, and will analyze the merits and effects of planning alternatives. The RPD will serve as a decision-making tool for Air Force commanders and their staffs, providing them with information on the near- and long-term consequences of their decisions. It will not, however, serve in lieu of command decision making, which must consider the political environment. The RPD will be designed to protect the usability of Air Force range land and airspace for current and future missions. Each Range Planning Document will be a publicly releasable document, in compliance with existing legislation.

The above procedures will serve Air Force commanders as management and decision-making tools in maintaining the control of Air Force ranges for effective use in programming existing and future missions, and to defend Air Force programs and activities in the public arena. Each Range Planning Document will provide major policy statements regarding the use and disposition of the appreciable natural and other resources of the Air Force Ranges. As such, it will require an Environmental Impact Statement (EIS). The RPD is designed to include all information required for the EIS, and EIS will accompany each RPD.

2. OBJECTIVE

The objective of this current effort is to identify those elements associated with Air Force air-to-ground ordnance delivery ranges that must be addressed in establishing an Air Force Range Planning Document. The purpose of the Range Planning Document is to define and support land and airspace requirements for air-to-ground ordnance delivery ranges used in support of military training and weapons system development.[a]

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[a]The need for Air Force environmental planning, including range planning studies, is described in:

1. AF/CC Letter of 30 May 1975, "Air Force Environmental Planning."

2. AF/PRE Letter of 8 July 1975, "Environmental Planning Function and Process Policy," and attachments.

3. Joint Logistics Commanders Study Panel, March, 1976 - Final recommendations.

SECTION III

STUDY METHODOLOGY, ANALYSES, AND FINDINGS

1. METHODOLOGY

Work under this contract was conducted in the following major steps:

a. Initial background meetings with range planning and operations personnel.

b. Review of Air Force range planning and related regulations, manuals, and other documents.

c. Review of appropriate non-Air Force literature pertaining to range planning issues.

d. Field visits to HQ USAF, Major Commands, and selected Air Force bases and ranges, and interviews with range planning and operations personnel.

e. Analysis and evaluation of information and data gathered in the above steps.

f. Development of candidate elements for a Range Planning Document.

g. Meetings with Air Force project and range planning personnel to discuss candidate elements.

h. Preparation of Draft Final Report.

i. Comments on Draft Final Report by Air Force personnel involved with range planning and operations.

j. Refinement and publication of Final Report.

Interviews and field visits constituted a major part of the work of this study. Extensive interviews were conducted with Air Force range planning personnel at range, base, Major Command, and HQ USAF levels (see Appendix A). In addition, field visits were made to Air Force ranges at Edwards Air Force Base, California (PIRA), and at Nellis Air Force Base, Nevada. Briefings and meetings on this subject have been held with Air Force personnel at the contractor's office and at various Air Force installations. In addition, Air Force range planning documents and other literature related to this subject have been reviewed and analyzed. The following is a summary of these activities.

- Initial meetings and briefings were held to identify the scope of range planning issues. Air Force documents and information on existing Air Force Range planning programs, including Air Force Regulations, were made available. These documents have been reviewed for their significance to this project. (A complete list of sources and individuals contacted is included in Appendices A and B.)

- In addition, applicable public laws, regulations, guidelines, and manuals of non-DoD federal agencies that may have an impact on range planning have been obtained and reviewed.[a] Ongoing range planning programs and activities, including the Range Compatible Use Zone Program (RACUZ), have been evaluated for their relationship to the range planning elements.

- Meetings and interviews have been held with range planning, operations, environmental planning, engineering, real estate, safety, security, test and evaluation, ordnance, instrumentation, radar control, natural resources, range management, scheduling, recreation, training, and other related range personnel at the following locations:

  HQ USAF, Pentagon, Washington, D.C.
  HQ AFLC, Wright-Patterson Air Force Base, Ohio
  HQ AFSC, Andrews Air Force Base, Maryland
  HQ TAC, Langley Air Force Base, Virginia
  Nellis Air Force Base, Nevada
  Nellis Ranges
  Edwards Air Force Base, California
  Edwards Precision Impact Range (PIRA)

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[a]Objectives, priorities, and techniques for land management are now under intense analysis and development in most federal agencies. In addition, several agencies are conducting resource surveys on or near Air Force range lands.

- Additional interviews were conducted with representatives of non-DoD agencies in Washington, D.C. These include:

  Bureau of Land Management
  Bureau of Outdoor Recreation
  Soil Conservation Service
  Office of Coastal Zone Management
  Fish and Wildlife Service
  Department of Housing and Urban Development
  Office of Endangered Species, USF&W Service
  Forest Service

- Field interviews and briefings were also conducted with Commanders of some of the installations and ranges visited, and their comments and suggestions on range planning issues and requirements were obtained.

- The interviews and field surveys have identified planning considerations, needs, and requirements of the various operational and support functions at range, base, MAJCOM, and HQ USAF levels, and have examined the interests of other federal agencies. The objective of the interviews has been to determine the manner in which needs and requirements at various levels may influence range comprehensive plans. Following the field visits and interviews, the documents obtained, including Range Planning Manuals (see Appendix B for listings), were reviewed and evaluated to identify appropriate range planning issues and considerations that could be addressed in a Range Planning Document.

2. ANALYSES

Analyses and evaluations of the information obtained from the field surveys, interviews, document review, and meetings conducted as part of this contract produced a large number of range planning considerations that could be addressed in a Range Planning Document. Questions arose as to the best way to organize and categorize these planning considerations in a logical and interrelated manner. The organization that appeared to be the most useful in the subsequent effort of developing a Range Planning Document was to view these considerations in the context of a general planning methodology. The planning methodology outlined below is one that has been developed by Woodward-Clyde Consultants for use by the Air Force in developing Base Comprehensive Plans. It has been reviewed by Air Force Environmental Planning personnel and by other Air Force staff, and has been found generally

acceptable. The planning methodology developed in the Range Planning Document will probably be most useful to the Air Force if it bears a strong relation to this Base Comprehensive Planning Methodology.

A generalized version of this planning methodology follows:

Step 1 - Problem Definition

a. Identification of planning objectives

b. Inventory of existing conditions and criteria

c. Identification of needs and requirements

Step 2 - Development of Planning Alternatives

Step 3 - Assessments of the effects of the Planning Alternatives

Step 4 - Evaluation of Planning Alternatives and Tradeoffs, and of Not Implementing the Recommended Alternative

Step 5 - Decision Making and Plan Implementation

The methodology includes feedback between each step to provide opportunities for adjustments and corrections along the way. For example, feedback may be required between Steps 1 and 2 once Planning Alternatives are explored to ensure that the correct problems are being addressed.

It is likely that the range planning methodology that will be developed in subsequent efforts will be similar to the methodology developed for Air Force Base Comprehensive Plans.

Figure 1 illustrates the methodology framework for the preparation of Base Comprehensive Plans.

3. FINDINGS

Within the context of the generalized planning methodology described above, the range planning considerations and issues that were identified

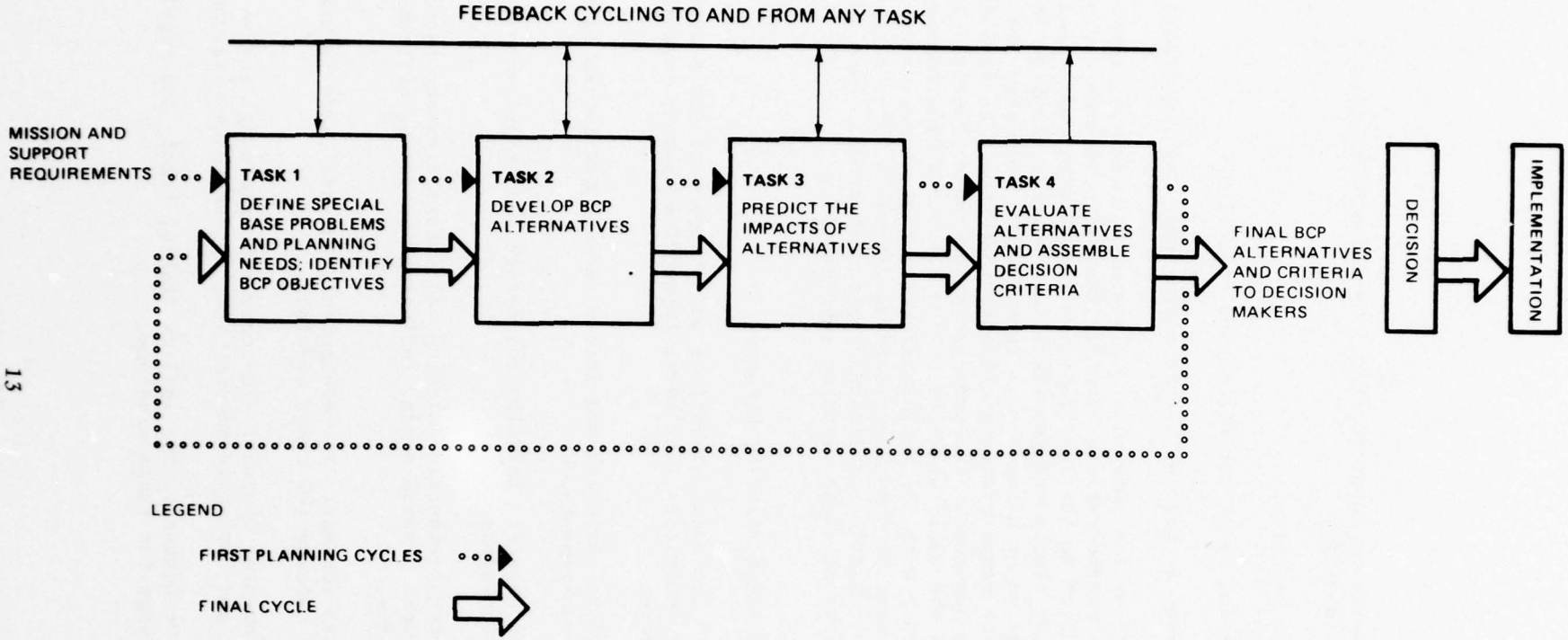


Figure 1. Methodology Framework for Base Comprehensive Plans

in this study all serve as input to Step 1 "Problem Definition." Specifically, they identify:

a. Range objectives

b. Existing range conditions and criteria

c. Present as well as future range needs and requirements

Viewed in terms of the generalized planning methodology, the range planning issues and considerations identify the basic information and data that are essential to the comprehensive planning process. Analyses of the range planning issues and considerations suggest grouping these considerations under major categories. These major categories are proposed as the major range planning elements that should be included in a Range Planning Document. The proposed major range planning elements will serve as the basic elements of the Range Planning Document. Each element, together with the many subelements that characterize the element, brings to bear on the range planning process a major category of range objectives, existing conditions, or future needs. (See Section IV for a complete listing of range planning subelements.)

4. PROPOSED MAJOR RANGE PLANNING ELEMENTS

A. Range Missions: The basic objectives and purposes of the range and range activities, including types of equipment supported by the range.

B. Range Capabilities: Existing and future range capabilities to meet mission requirements.

C. Range Land Requirements: Existing and future land requirements to meet mission needs.

D. Range Airspace Requirements: Existing and future airspace requirements to meet mission needs, including supersonic airspace requirements.

E. Natural Resources Context: The ecological, cultural, and natural resources setting for range missions.

F. Community/Governmental Context: The community planning, socio-economic, and intergovernmental setting for range missions.

G. Legal/Legislative Context: The land ownership, legal, and regulatory settings for range missions.

H. Range Administration: The administrative and implementation functions required to meet existing and future range needs.

I. Range Operations: The operational functions required to meet existing and future mission needs.

a. Interrelationships among Elements

By their nature, each of the major elements identified above is closely interrelated with each of the other elements. For example, range missions can be accomplished only if adequate range land and airspace are available and range capabilities (instrumentation and other equipment) are in order. In addition, recent legislation requires detailed information on what ecological, cultural, and natural resources exist on Air Force ranges, and on how range missions may impact these resources. Additional uses of ranges by local communities (for recreation, grazing, mining, timbering, ORVs, etc.), and by other governmental agencies, can significantly affect range missions. A related issue is the effect of terms and conditions of range leases, land ownership rights, and other regulatory constraints on range missions. Finally, range missions influence, and are affected by, range administrative and operations capabilities and procedures.

This brief overview indicates the interrelationships and dependencies between range missions and other range planning elements. As described above, the elements are interrelated, and therefore all elements must be considered in the comprehensive planning process for the development of Air Force Range Planning Documents. All elements are not, however, equal in value.

5. NEEDS AND REQUIREMENTS FOR RANGE PLANNING DOCUMENTS AT VARIOUS LEVELS OF COMMAND, AND AT NON-DoD AGENCIES

In addition to providing information on range planning considerations and issues, the interviews and field visits have also identified differing needs and requirements for range planning documents at various levels of command within the Air Force, and at non-DoD agencies. These needs and requirements will influence the content of the Range Planning Handbook, which is to be the product of a subsequent and related study. However, a review of these requirements, outlined below, is useful in evaluating the appropriateness of the proposed Major Range Planning Elements to these differing requirements.

The needs for a Range Planning Document vary with level of command, major command, and range mission. As an example, needs are here listed by level of command:

HQ USAF:

a. Mission assignments
b. New weapons system deployment sites
c. Reviews of natural resource plans
d. Compliance with federal laws
e. Budgeting, particularly in developing budget priorities
f. Determine value of range to USAF
g. Real estate acquisition and disposal
h. New programs for training and test/evaluation
i. Coordination with other services and tenant organizations
j. Coordination with Congress
k. Coordination with non-DoD agencies
l. Review of environmental impact reports and compliance with environmental legislation
m. Review requests for private and commercial uses
n. Review requests for mineral exploration
o. Need for large scale and/or joint operations
p. Determine need and location for large scale and/or joint approach

MAJCOM:

a. Range capacity
b. Range utilization
c. New weapons system siting
d. Operating and construction costs
e. Equipment budgets
f. Environmental aspects
g. Budgeting priorities
h. Range manpower
i. Resource survey data
j. Range air space requirements
k. Range land requirements
l. Range capabilities
m. Range planning studies
n. Outlease programs
o. Coordination between ranges
p. Coordination with non-DoD agencies
q. Review requests for private and commercial uses
r. Review requests for mineral exploration
s. Scheduling
t. Real estate acquisition and disposal

Bases:

a. All range support requirements
b. Public information
c. Environmental assessments and compliance with environmental regulations
d. Facilities budgeting
e. Roads
f. Utilities
g. Liaison with local planning agencies
h. Range manpower
i. Equipment
j. New and improved facilities programs
k. Equipment improvements
l. Repairs and maintenance
m. Military Construction Program (MCP)
n. OMB A-95 review process

Bases (cont.)

o. Community interface
p. Land and air space encroachment
q. Accidents
r. Community socioeconomic issues
s. Recreation and other public uses of range lands
t. Coordination with other agencies
u. Scheduling
v. Real estate acquisition and disposal
w. Historical and archaeological/natural resources

Ranges:

a. Range missions
b. Capabilities
c. Land requirements
d. Air space requirements
e. Range operations
f. Range administration
g. Security
h. Safety
i. Range instrumentation and equipment
j. Land use
k. Ordnance
l. Natural resources
m. Environmental issues
n. Housing for range personnel
o. Roads
p. Communications
q. Utilities
r. Local community issues
s. Climate
t. Construction requests
u. Work requests
v. Day-to-day detailed working requirements
w. Repairs and maintenance
x. Working schedules and shifts
y. Civilian labor issues
z. Availability of operable range equipment

Non-DoD Agencies:[a]

a. Compatible or competing requirements for use of land now in Air Force ranges
b. Reasons and evidence for buffer zones, including RACUZ criteria
c. Data on natural resources
d. Environmental impacts of mission activities
e. Noise data
f. Accident data
g. Ordnance safety hazard data, including RACUZ
h. Land withdrawal requirements
i. Land acquisition requirements
j. Community and regional planning issues
k. Intergovernmental coordination and review
l. Compliance with environmental legislation and other federal laws
m. Air space coordination with FAA and other agencies
n. Coordination for local and regional transportation and utilities corridors.

[a]HQ USAF/PRER, MAJCOMs, and bases review requests for non-Air Force use of Air Force ranges. AFR 87-3 identifies specific divisions of responsibility.

SECTION IV

IDENTIFICATION AND CHARACTERIZATION OF RANGE PLANNING ELEMENTS

INTRODUCTION

During our meetings and interviews with Air Force personnel and with representatives from other federal agencies (Appendix A), and from our review of documents (Appendix B) we have identified a lengthy list of considerations of importance to Air Force range planning. The objective of this section is to present these considerations in a format that will tie directly into the proposed Range Planning Handbook, and that will identify the key range planning elements and subelements. This section will also characterize the major elements and provide a general rationale for their inclusion. A more specific rationale for inclusion is provided by the considerations themselves; repeated acknowledgment of their roles in efficient and timely range functioning, as described during numerous interviews provides adequate justification for their inclusion.

After attempting various ways of organizing these considerations, it was decided that the most useful format would be to organize them as though they were actual entries in the Range Planning Handbook. Thus each consideration has been presented as a request for some analysis, together with requests for the information necessary to perform the analysis. In the overall planning process, the considerations presented here fall into three categories:

a. Objectives, or the aims to be satisfied in the planning process, as represented by the description of present, anticipated, and projected missions;

b. Description of existing conditions; and

c. Identification of problems, needs, and requirements for existing or future missions.

These categories are the basic ingredients of the planning process. In addition to the planning element sections described in this chapter, the Range Planning Handbook will also contain sections describing means for generating alternative plans based on these planning elements, and for implementing such plans.

The outline presented in Table 1 indicates the emphasis of the Range Planning Document, based on expressed concerns about range planning needs. By definition, comprehensive planning includes all aspects of range deployment and operation. However, most aspects involving actual operation and management are well-covered by existing regulations, documents, and planning procedures. Accordingly, these aspects have been grouped as two elements (Range Administration and Range Operations), and are included at the end of the list of elements. It is anticipated that the Range Planning Document will function primarily as a summary document in these areas, presenting information as necessary for overall comprehensive planning, but avoiding recapitulation of all of the steps and analyses presented elsewhere. Other areas are of increasing concern because of recent legislative developments, and become an integrated part of an overall planning process in this document. Land and airspace requirements are dealt with extensively, particularly in the context of RACUZ guidelines. Natural and cultural resources are discussed in light of the National Environmental Policy Act (NEPA) and its subsequent interpretation and significant implications for Air Force land use. Community relationships are developed to integrate Air Force land use with increasingly prominent and powerful regional and local developmental plans. A concise and appropriate summary of the maze of legal constraints on range land use forms a final necessary element in any long-term decisions regarding such use.

The Air Force mission must be emphasized as the primary consideration. It is the driving function of all range planning efforts. Accordingly, the Range Mission element is listed first, and establishes the primary needs and requirements.

Most missions involve some classified information, and this information must be accommodated in the planning process if the plan is to be responsive to the full mission. The present outline seeks only to identify all of the considerations that are essential to complete and useful comprehensive range planning; therefore, it may identify topics involving some classified subjects. To meet the objectives of a publicly releasable Range Planning Handbook and Range Planning Document, required classified information and analyses must be presented in auxiliary documents. The exact format and mechanisms for doing this will be worked out during the course of development of the Handbook.

The listing of range planning considerations in Table 1 is not represented as being complete, and the presence of an item does not imply that it will appear in the final handbook. A complete and accurate listing of range planning elements will be possible only when the methodology is worked out and tested, and when its requirements are fully known. However, the outline should provide an accurate perspective on the general content of the handbook sections dealing with the description of existing conditions and the identification of needs and requirements.

Table 1. SUMMARY LISTING OF RANGE PLANNING ELEMENTS AND SUBELEMENTS

I. Range Missions

- D.1 Current mission
- D.2 Expected future missions
- D.3 Projected mission modifications

II. Range Implementation and Support Facilities

- D.1 Existing implementation and support facilities
- D.2 Chief assets and limitations
- D.3 Existing plans for improvement and modernization
- D.4 Identifying needs for improvement and modernization

III. Range Land Requirements

- D.1 Land requirements for present missions
- D.2 Suitability of existing land
- D.3 Land required for expected and projected future missions
- D.4 Limitations on land use

IV. Range Airspace Requirements

- D.1 Current airspace requirements
- D.2 Limitations on airspace use
- D.3 Future airspace requirements

V. Natural Resources Context

- D.1 Inventory of resources
- D.2 Resource management
- D.3 Rehabilitation
- D.4 Integrating resource management with mission requirements

VI. Community/Governmental Context

- D.1 Land use
- D.2 Local community relations
- D.3 Intergovernmental relationships

VII. Legal/Legislative Context

- D.1 Land use agreements
- D.2 Outleases and outgrants of range lands
- D.3 Potential liability
- D.4 Future missions
- D.5 Legislation

VIII. Range Administration

- D.1 Organization and coordination
- D.2 Planning and implementation guidelines
- D.3 Implementation process
- D.4 Supplemental fund source
- D.5 Range performance data

IX. Range Operations

- D.1 Scheduling
- D.2 Safety
- D.3 Equipment and facilities maintenance
- D.4 Security
- D.5 Personnel
- D.6 Coordinated use of multiple ranges

I. RANGE MISSIONS

A. Characterization

The Air Force mission (reference AFM 1-1) must be emphasized as the primary consideration. In this context, the value of continued range operation to defense preparedness must be included in the range planning process. The overall objective of the range plan is to facilitate this mission in a cost effective manner. This element describes that mission, and it is therefore the keystone of the planning process. The mission element will include three major subelements: a description of the current mission, an elaboration of projected future mission changes[a], and an analysis of mission assignment processes designed to project mission changes for the near term (e.g., to use previous unanticipated changes to project as many characteristics - frequency, type, magnitude, etc. - as possible for any future mission changes that would not be anticipated in normal base-level range planning). This element will describe the range type or types, and will identify the kinds of testing and training activities that are currently or are anticipated to be conducted at the range. It will also describe which unit and command has the lead responsibility for the operation of the range.[b] The range mission element will identify tenant organizations and/or regular users of the range (USAF and other agencies).

B. Rationale

This major range planning element is included as the driving function for all range planning efforts. Range mission accomplishment directly supports the broader Air Force mission. Non-military considerations, while important, must not jeopardize the basic Air Force mission. Existing mission needs and problems, together with future mission requirements, form the basic objectives that must be accommodated in the development of range plans. An adequate description of present and future missions is therefore a key step in developing an adequate and useful comprehensive range plan. All range activities should contribute directly or indirectly to the accomplishment of the range mission. Effective range planning can only be done when these activities and their relationships to the mission(s) are known.

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[a]It is recognized that certain aspects of future missions may be classified, and that a separate section dealing with this classified information may be required.

[b]AF/PRPO will be involved in the development of this element.

C. Use of this Element at Various Levels of Command

1. HQ USAF

The range missions element will be extremely valuable at HQ USAF for decision making and staff work related to internal Air Force budgeting and priorities, and while coordinating with non-DoD agencies. Provision for existing and future mission needs is the basic requirement for all Air Force range planning activities. Information on these requirements is essential in the development of new weapon systems programs, real estate negotiations, new programs for training and testing, justifications for land and air space, and for compliance with environmental legislation and other federal laws. In addition, AF/PRPO will find this information valuable for mission assignments and reassignments.

2. MAJCOM

This mission element will be extremely valuable to Major Commands in their assignments of range use, coordination among ranges, negotiations for range land requirements and for airspace requirements, assignment of range personnel, coordination of range improvement programs, and for environmental studies. This element will serve as a valuable tool with which Major Commands can make range manpower, equipment, and facilities projections to ensure range capabilities to meet current and future mission needs.

3. Bases

This element will provide a useful source for base commanders and staff to plan for range support in terms of manpower, equipment, and facilities. It will also serve as an essential element for environmental assessment, and for liaison with planning agencies. Facilities and equipment improvement programs, as parts of the Military Construction Program (MCP), will be based in part on the information contained in this element. In addition, potential issues related to the impacts of existing and proposed missions on the nearby communities, and on the natural resources existing on range lands, can be evaluated on the basis of mission requirements.

4. Ranges

This element will be essential for effective future range planning. Detailed requirements of existing and future range missions are needed by range commanders to ensure that range schedules, equipment, facilities, manpower, and other factors will be available in a timely manner

to meet these mission requirements. This range missions element will identify needs for land and airspace requirements, security, safety, manpower, equipment, roads, communications, utilities, housing, work schedules, and other factors essential to the effective performance of the range in support of its missions.

D. Outline of Subelements

1. Current Mission

a. Mission definition. Define existing mission (or multiple missions) for range
b. Range type. Identify type of range as listed in AFM 50-46
c. Identify lead responsibilities in development of systems, facilities, etc., for other ranges
d. Testing. Identify types of testing activities conducted:

(1) Air-to-ground
(2) Air-to-air
(3) Electronic warfare
(4) Aircraft
(5) Other (e.g., systems, non-munitions, performance)

e. Training. Identify types of training activities conducted:

(1) Air-to-ground
(2) Air-to-air
(3) Electronic warfare
(4) Other

f. Test vehicles. Identify types of test vehicles and delivery systems to be used on ranges
g. Ordnance. Identify frequency, types, and explosivity of ordnance
h. Identify all regular and recurring users of range (USAF and other agencies)

2. Expected Future Missions[a]

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[a]This element would address expected future missions within the Air Force's current five year planning horizons as well as tentative projections beyond that time period to the extent that reliable information is available. These planning time horizons will be further specified in subsequent efforts.

a. Recent test/evaluation/training program assignments
b. Acquisition priorities and guidelines

3. Projected Mission Modifications

a. New ordnance
b. New delivery vehicles
c. New delivery technology/tactical profiles
d. New training systems
e. Projected test/evaluation/training program assignments

II. RANGE INSTRUMENTATION AND SUPPORT FACILITIES

A. Characterization

The objective of this element is to explore the capacity of the range to accommodate present and future mission needs. Major subelements will identify present capabilities, chief assets and limitations, and existing plans for improvement and modernization of range equipment and facilities, and will identify or provide mechanisms for identifying and assigning priorities to further improvement and modernization. This element will identify the event capabilities of the range (e.g., strafe, bomb, rocket, nuclear, air combat maneuvering, electronic warfare training, testing and evaluation, etc.) and the communications and instrumentation support capability of the range in terms of air traffic control, tracking and positioning of aircraft and other vehicles, intrarange and inter-site communications, electronic weather equipment, electronic countermeasure devices, and related electronic systems and equipment for range operations. Target types available at the range, scoring systems, range facilities, and support systems will also be described. Key range assets assuring flexibility for further missions will be identified, and present limitations on flexibility will be explored. Existing plans for improvement and modernization of equipment and facilities will be reviewed, and future equipment needs will be identified on the basis of planned and projected future missions. Military installations within operating distance of the range will be identified. The carrying capacity (amount of use) as based on the specific capabilities outlined in this element is estimated in Element I, Section A-3.

B. Rationale

The ability to perform present and future range missions depends heavily upon the capabilities of the range in terms of equipment, facilities, monitoring and scoring devices, instrumentation, proximity to airfields, and timely communications links. Effective mission performance requires that range facilities and equipment be available and functional. Effective range planning will require that existing range capabilities be identified, and that future range carrying capacities be known. Advance analyses of future range missions in relation to range capabilities are the key elements in range assignments and planning. In addition, the flexibility of a range to accommodate changing and unanticipated missions will have high value in range planning, use, and acquisition and additional missions. Accurate description and monitoring of range capabilities will be critical for these purposes.

C. Use of This Element at Various Levels of Command

1. HQ USAF

This element will be a key source for HQ USAF information on the capabilities of each Air Force range. This information will be critically important in the assignment of new missions, or in the modification of existing ones. It will also indicate those improvements necessary for specific ranges to meet the needs of present and future missions, and those capabilities required for test and evaluation of new systems which may not be present at existing ranges.

2. MAJCOM

For those ranges controlled by MAJCOMs, the range instrumentation and support facility element will provide major commands with a single source for information necessary for effective range coordination and management. It will become a valuable tool for overall range scheduling, budgeting for new equipment and facilities, new training and testing programs, modifications to existing missions, and for the assignment of new missions. It will become a valuable planning tool for coordination among existing ranges that have similiar mission requirements. It will also provide a consistant basis for setting priorities for the range improvement budget and MCP funds.

3. Bases

For those ranges controlled by base-level commands, this element will be a source for basic information for range support at the base level, including construction program budgeting, manpower assignments, equipment purchases, and general range support requirements. It will also serve as a valuable planning tool, identifying those range improvements required to meet existing and future mission needs.

4. Ranges

This element will provide range commanders with direct information on the range capabilities and/or limitations in terms of range mission requirements. It will also identify modifications and improvements required to meet existing and future mission needs. The range instrument and support facilities element will identify range target, instrumentation, equipment, manpower, land, airspace, and other capabilities for use by range commanders for planning purposes in the improvement and modernization of existing ranges to meet future mission requirements.

D. Outline of Subelements

1. Existing Capabilities

a. Event capabilities. Describe capabilities of the following types:

(1) Strafe
(2) Bomb (Conventional, LGB, GBU, Nuclear)
(3) Rocket
(4) Dart
(5) Missile
(6) Air combat maneuvering
(7) Electronic warfare training
(8) Testing and evaluation
(9) Large scale operations, manuvers, and exercise
(10) Other

b. Communication-Electronic Equipment/Systems Availability

(1) Air traffic control/ground-to-air:
Radar, navigational aids, air traffic control, EARTS, FM, UHF, VHF, HF radio systems
(2) Intrarange:
Landlines, VHF, teletype, wideband microwave, audio tape recorders, FM, voice microwave
(3) Inter-site:
Landlines, HF radios, wideband microwave systems, FM, voice microwave
(4) Base communications systems:
Communications-electronics-meteorological systems and facilities for range control centers and for other on-base facilities dedicated to range operations
(5) Electronic systems:
All ground electronic devices and systems for control and tracking of aircraft and ordnance, scoring, electronic weather equipment, electronic countermeasures devices, and related electronic systems and equipment
(6) Frequency/spectrum management

c. Targets

(1) Target types available
(2) Degree of target range sophistication -- types of scenarios used

d. Scoring and Data Collection
Electronic strafe, M-2 Aiming Circle, Optical Scoring, Cinetheodolites, timing systems, radars, high speed cameras, TV scoring system, LASER, telemetry

e. Support

(1) Facilities and support
(2) Access and transportation; road network and surface communications
(3) Utilities
(4) Land/interest availability
(5) Military airfields within operating distance of the range

f. Intelligence security systems

2. Chief Assets/Limitations

a. Identify key range characteristics that make it suitable for the current mission and aircraft
b. Identify assets that assure flexibility for unforeseen missions. Key areas for flexibility include ability to accommodate changed footprints, flightpaths, instrumentation, etc.
c. Range limitations. Identify key limitations on range flexibility. Describe the limiting factors on current and future range use, including all environmental factors limiting full use of range lands
d. Identify EMR sources in area and potential conflicts; activities that would restrict AF use of EMR.

3. Existing Plans for Improvement and Modernization. Identify major planned improvements that will affect the ability to conduct missions

4. Identify Needs for Improvement and Modernization of Equipment

a. Describe procedures for accommodating the continuous need for update of equipment

(1) Responsibility
(2) Identification of new types of equipment
(3) Integration and compatibility of new equipment into existing programs

b. Using planned and projected mission assignments, identify future needs for improvement and modernization of facilities and equipment

III. RANGE LAND REQUIREMENTS

A. Characterization

The objectives of this element are to identify the land required for effective and safe conduct of missions, and, using projections for future missions (from Element A), to determine how these land requirements will change in the future. Techniques can also be used to identify range land suitability for a given candidate mission. Major subelements include an analysis of actual land requirements for the present mission, an identification of additional land requirements to meet present safety needs and allow more efficient conduct of existing multiple missions, and an analysis of future land needs based on expected and projected mission needs. Key aspects will involve the accurate and defendable designation of necessary buffer zones, and the identification of activities and developments that are compatible with these buffer zones. Based on mission needs and RACUZ criteria, present and potential future land encroachments will be identified. The graphic output will include a series of maps and overlays that locate and identify major range activities.

This element will also describe the rationale for the Air Force personnel and civilian safety zones outlined above, will indicate the manning and servicing schedules for each facility and piece of range equipment, and will include procedures for changing target locations and types to meet mission needs. Mission activities that do not require fixed land activities (e.g., troop maneuvering areas) will also be described.

B. Rationale

This element differs from the previous element, Range Instrumentation and Support Facilities, in that it describes the physical requirements (land) needed to meet current and future missions, while the previous element identifies what mission types can be supported by the range. Current and developing land encroachment and environmental issues make it essential for range land uses and needs to be accurately and consistantly assessed. Critical range land requirements and land use issues must be identified during the planning process so that Air Force policy and programs can respond to these needs. This planning element will examine the various categories of existing and future range land use, with emphasis on target and buffer zones, and on range personnel and civilian safety areas.

C. Uses of this Element at Various Levels of Command

1. HQ USAF

This element will identify land acquisition needs for existing ranges to meet present and future mission requirements. It will be extremely useful, at this level of command, for the support of budget requests, coordination with non-DoD agencies, and justification for the continued withdrawal of public domain lands for Air Force range use.

2. MAJCOM

This element will be valuable to review land acquisition requirements to meet current and proposed mission needs originated at range and base levels. This element will directly relate Air Force range mission requirements to existing land space in order to identify additional lands required to meet mission needs.

3. Bases

This element will identify land encroachment issues and land acquisition requirements to meet current and proposed mission needs, and to be used as part of the Military Construction Program (MCP). It will also identify the suitability of existing land space for current and projected mission use, and will provide extensive facility siting guidance.

4. Ranges

This element will be useful to range commanders while preparing for new mission assignments, and for modifications of existing ones. In addition, this element will be useful in the improvement of existing ranges to meet current mission needs (e.g., identifying new target locations, siting of new facilities, etc.).

D. Outline of Subelements

1. Land Requirements for Present Mission(s)

a. Inventory of land use. Identify each of the following areas on a series of maps and annotate as necessary:

(1) Targets and parachute drop areas
(2) Required target buffer zones for Air Force personnel safety, as based on AFM 50-46 guidelines and specific ordnance footprint safety information
(3) Required target buffer zones for civilian safety, as indicated by RACUZ, including noise, accidents, and ballistics footprints
(4) Required land safety zone for armed phase of aircraft target approach
(5) Locations of facilities and equipment:
- Permanent, housing and domestic, support, storage, monitoring, etc.
- Typical locations or location parameters for mobile equipment
(6) Access roads and utilities corridors to all facilities, including mobile facilities
(7) Target areas and vicinity searched and cleared by EOD personnel
(8) Target areas regularly resurfaced
(9) Required support facilities, including those off-range (emergency landing areas, jettisoning areas for hung ordnance, aircraft malfunction, etc.)
(10) Support areas required for occasional or other uses (Bold Eagle, National Guard exercises, etc.)

b. Safety and buffer zones. Indicate the rationale for the personnel exclusion and civilian safety zones outlined above. Note the sensitivities of the various parameters to elements typical of mission changes, such as vehicle speed, altitude, type of weapon, etc.
c. Personnel deployment areas. Indicate the manning and servicing schedules for each facility and piece of equipment
d. Special use areas. Vehicle or support personnel staging areas during live ordnance drops
e. Target maintenance

(1) Give schedules for target repair and range cleanup, indicating frequency and intensity of search at various distances from targets
(2) Indicate frequency of resurfacing for targets
(3) Indicate procedures for changing target locations and types to meet mission needs

f. Off-range support sites

2. Suitability of Existing Land. Identify restrictions on range land use that affect present and future missions

   a. Existing safety buffer zones may not provide an adequate buffer for civilian use of adjacent range lands
   b. Existing land does not allow adequate separation of target areas, so that several targets cannot be used at the same time, appreciably restricting mission performance
   c. Existing land allows insufficient realism for tactical training exercises. (Identify the success of the present program for target movement)

3. Land Required for Expected and Projected Future Missions. Identify land requirements arising from new or modified missions and for future planned missions.

4. Limitations on land use. See elements V, VI, and VII.

IV. RANGE AIRSPACE REQUIREMENTS

A. Characterization

The objectives of this element are to identify the airspace required for effective and safe conduct of missions, and, using projections for future missions (from Element A), to determine how these airspace requirements will change in the future. Major subelements include a description of current airspace requirements, present limitations on airspace use, and projection of future changes in airspace requirements.

Key aspects of this element will involve identifying present and future conflicts and restraints arising from airspace needs of the general public and other federal agencies, and providing for access and some degree of control over required airspace. This element will present an inventory of existing airspace use in the form of maps and overlays, including approach and exiting corridors for the range; target approach pathways; airspace maneuvering areas; and ground impact patterns corresponding to airspace uses, using RACUZ guidelines, including noise, accidents, and ballistic footprints. The element will also describe limitations on supersonic manuvering and whether IFR/VFR procedures are applicable. The maps described above will be annotated to indicate the frequency of use for the various airspace corridors and pathways.

B. Rationale

Target areas are only as versatile and useful as their approach pathways, and therefore access to appropriate airspace is a necessary prerequisite for successful mission performance. Continued demand for airspace by general and commercial aviation, combined with increasing airspace demands by new weapons delivery systems, and increased requirements for supersonic flight requires that an accurate assessment of actual and future airspace needs be made. Airspace needs must be integrated with those of other airspace users, including multiple Air Force missions and other DoD and non-DoD agencies within one range airspace or within a complex of range airspaces. Complaints from nearby communities about noise and other factors related to Air Force range use may lead to additional restrictions on airspace use. These contemporary problems are likely to be exacerbated in the future. Increasing speeds and altitudes of aircraft using ranges, and the increasing sophistication of weapons systems, are likely to increase airspace needs greatly. Accurate identification of existing and future airspace needs, and the location of air corridors convenient to target locations, remains a crucial issue in present mission accommodation and in the provision of flexibility to accommodate future missions.

C. Use of This Element at Various Levels of Command

1. HQ USAF

This element will be extremely useful to HQ USAF decision makers and staff in their ongoing work of planning new missions, and in the coordination of airspace with non-DoD agencies (FAA and others). The element will identify current airspace requirements, limitations on airspace use, and future airspace requirements to meet proposed missions.

2. MAJCOM

This element will be a valuable planning and coordination tool for major commands. It will identify critical airspace issues in terms of Air Force, commercial, and general aviation use. It will also serve as a coordinating tool in developing methods to link nearby airspaces for similiar mission uses.

3. Bases

This element will serve as a planning and coordinating tool for base air operations, Air Traffic Control Boards, coordination with other airspace users, and for coordination with community planning agencies. It will also be valuable in analyzing existing and potential community complaints due to aircraft noise and/or sonic booms.

4. Ranges

The range airspace element will serve as a valuable tool to the range commander in planning for range missions. It will identify airspace requirements for current missions and limitations on existing airspace use. This element will assist in the coordination of range facilities, equipment, and manpower in support of range missions.

D. Outline of Subelements

1. Current Airspace Requirements

a. Inventory of airspace use. Indicate the following on maps, using overlays as necessary:

(1) Identify airways from home station to ranges, and frequency of use
(2) Identify approach and exiting corridors for range at various altitudes and speeds (including multiple and unrestricted approaches)
(3) Identify target approach pathways for each:
- Target/ordnance type
- Plane/speed type
- Altitude
(4) Indicate areas for maneuvering before, after, and between passes at the target
(5) Draw ground impact pattern corresponding to this airspace using RACUZ guidelines
(6) Indicate areas/altitude blocks authorized for supersonic flight

b. Use frequency. Indicate the frequency of use for the various airspace corridors and pathways identified above

c. Control of airspace. Indicate on a map the type of control exercised over the various types of airspace identified in 1.

(1) Restricted
(2) Controlled
(3) Case-by-case
(4) Other

d. Use compatibility. Identify use compatibility zones for lands under required airspace, including elements of accident, noise, etc.

2. Limitations on Airspace Use

a. Encroachment. Identify airspace encroachment problems that may affect future missions

(1) Identify targets that cannot be used at the same time because of airspace limitations
(2) Indicate targets that can be used by fewer than the desired number of aircraft in exercises because of airspace limitations
(3) Indicate ranges that cannot be used simultaneously
(4) Indicate other Air Force activities that limit range use:

- Air-to-air range
- Military operating area
- Remotely-piloted vehicles (RPVs)
- Electronic emisions and electronic countermeasures

(5) Indicate encroachments by non-Air Force activities:
- Airports
- Commercial aviation pathways
- Intrusions by general aviation
- Restricted airspace under non-Air Force control

(6) Supersonic corridors. Identify requirements for supersonic corridors, particularly at medium and low levels

(7) Identify navigation requirements arising from terrain and man-made obstructions, on or off the range

(8) Identify needs to coordinate use of range airspace with that of non-Air Force controlled areas:
- Flight plan clearance
- Use of airspace outside controlled areas
- IFR/VFR procedures

(9) Identify needs for airspace that is not over range lands

b. Waivers. Identify existing airspace waivers:

(1) Necessity
(2) Basis
(3) Future

c. Noise. Aircraft-associated noise and sonic booms.

(1) Noise contour map based on present or projected future missions
(2) Location and frequency of civilian complaints

d. Bird/Aircraft Strike Hazard considerations.

3. Future Airspace Requirements

a. Mission changes. Determine changes in any of the above categories arising as a result of a change in mission

b. Critical problems. Identify problems that are most critical to continued effective use of the range land.

V. NATURAL RESOURCES CONTEXT

A. Characterization

The objective of this element is to explore alternative uses for Air Force range lands, both to identify lands that have unique natural and cultural resources entitled to preservation under current environmental law, and to identify compatible multiple uses consistent with presently accepted guidelines for deployment of lands held in the public trust. Major subelements include an inventory of resources, identification of management and management needs, rehabilitation requirements, and integrating resource management and mission requirements. This element will identify, describe, and map each of the following types of resource areas:

- Natural resources, including ecological resources (resources primarily of interest for ecological reasons, including plants and animals, and threatened and endangered species and their habitats); and economic resources (resources having some explicit market value, including minerals, water, natural watershed or aquifer recharge areas, soils and timber).

- Potential natural products industries, including agriculture, hunting, fishing, grazing, recreation, and basic or applied resources research.

- Cultural resources, including archaeological sites, historical sites, natural areas, and aesthetic resources.

The qualities of range lands, their soil and vegetation types, and their land-use capabilities will be indicated on the maps. The degree of protection required in each of the natural resource areas will be identified and summarized, and determinations will be made as to the degree of compatibility of resource exploitation or preservation at these sites with current mission activities. Existing management plans for natural resources will be reviewed, and needs for further management plans will be determined. Criteria for compatibility with mission use will be developed.

B. Rationale

On one hand, natural resources on range lands represent potential limitations to the mission use of range lands, since many types of

natural and cultural resources are protected by environmental legislation, and these resources can be displaced under certain conditions only by activities that have no alternate location. On the other hand, natural resources represent an asset to the range by providing compatible alternative uses for range safety buffer zones. By the development of a resource oriented, multiple use management system, these ranges can be much more intensely used in a manner that will be more visible to the public. These highly visible public uses can help to remove the objection that vast lands in the public domain are being withdrawn from legitimate public use while not being intensely used by the Air Force. For compliance with current environmental legislation, the kinds and locations of natural resources on Air Force ranges must be identified. When resources are known, the natural resource values can be accommodated within Air Force mission plans, and range planning documents can be constructed that recognize these natural resource values. Natural resource planning must be conducted simultaneously with range planning in order to make resource management plans compatible with present and future mission requirements. Planning can minimize constraints on range flexibility to accommodate future mission needs.

C. Use of This Element at Various Levels of Command

1. HQ USAF

This element would provide the environmental setting in terms of ecological, cultural, and natural resources that exist on Air Force ranges. It would include inventories of existing natural resources suitable for environmental impact reports and compliance with other federal regulations. This element would be extremely valuable to HQ USAF staff in dealing with non-DoD agencies, such as the BLM, Forest Service, etc.

2. MAJCOM

This natural resources element would provide the basis for natural resources management programs at major command levels. It would identify compatible and incompatible land uses in relation to mission requirements, and it would also deal with potentials for outlease programs (e.g., grazing, timbering, mining, and other activities).

3. Bases

This element would be a valuable tool in dealing with community planning agencies and the local offices of other regulatory agencies that may

control lands used by the Air Force for range activities. This element would provide the information required by law in terms of threatened and endangered species, cultural resources, economic, and other natural resource values.

4. Ranges

This element would be an effective tool for range commanders in developing natural resource management plans within the context of Air Force mission needs. It would identify critical natural resource areas, and the potential to rehabilitate lands no longer used for targets or other Air Force purposes.

D. Outline of Subelements

1. Inventory of Natural Resources

a. Environmental quality

(1) Climate
(2) Natural hazards
(3) Air quality
(4) Water quality in surface and groundwater bodies
(5) Identify natural or semi-natural areas providing significant services, including absorption of sound by vegetation, dispersion and absorption of pollutants, and of soil erosion.
(6) Evaluate uniqueness of natural environment relative to that of surrounding area, taking into account degree of development and intensity of use, as well as resources actually present.

b. Natural resources - ecological. Each of the following refers to an area that offers potential conflicts with mission use. Indicate on range map overlays the locations of each of the following; then describe the resources involved and reference studies describing appropriate values, requirements, and management approaches. Ascertain by consultation with appropriate federal and state agencies what degree of protection is required in each of the areas designated, and summarize this information in map overlays.

(1) Kinds of plant and animal communities and major organisms; identify general types, key species, values,

and importance, and general patterns of community succession
(2) Threatened and endangered species and their habitats
(3) Critical resources
(4) Migration corridors for land migrants
(5) Flyways and stopover points for birds
(6) Unique natural areas
(7) Fragile habitats
(8) Important concentrations of fish and wildlife
(9) Use areas for commercial and recreational species

c. Natural resources - economics. Map the locations of any natural resources that appear to have present or future exploitation value

(1) Minerals
(2) Water
(3) Natural watershed or aquifer recharge areas
(4) Soil types
(5) Timber

d. Potential natural products industries. Evaluate the rangeland for suitability for sustained yield or continued use for each of the following. If any land is determined to be suitable, it should be indicated on overlay maps and its quality for the industry should be indicated

(1) Agriculture; prime and unique farmlands
(2) Grazing
(3) Outdoor Recreation (hiking, picnicking, camping, sports, ORV)
(4) Hunting and fishing
(5) Basic or applied resources research

e. Special interest areas. Identify areas falling into the following categories, and determine by consultation with appropriate federal and state agencies the degree of compatibility with mission use. Locate on map overlays.

(1) Archaeological sites
(2) Historical sites
(3) Cultural sites
(4) Aesthetic resources and scenic vistas
(5) Wilderness areas, wild and scenic rivers, wildlife refuges, natural areas, etc.
(6) Other natural or man-made structures of unique beauty and interest

Alternative active uses of range lands and their impacts on Air Force missions should also be addressed.

2. Resource Management

a. Resource management plans. Identify existing plans or needs for additional plans for:

(1) Threatened and endangered species and their critical habitats
(2) Key wildlife areas, habitats of unique value, and other ecological resource areas
(3) Fish and wildlife resources
(4) Water and air quality
(5) Cultural resources
(6) Water conservation and watershed management
(7) Soil conservation
(8) Forest management
(9) Outdoor recreation
(10) Rehabilitation of range areas, including natural restoration and vegetation

b. Monitoring Air Force resource use practices.

(1) Summarize the results of any follow-up studies that have been made in connection with environmental impact reports or other actions demanding monitoring, such as grazing outleases, Bold Eagle, relative to success of management in maintaining environmental values and obtaining its objectives.
(2) Multiple uses. Identify past land use practices made to facilitate multiple land uses among ecological, cultural, and natural resources, and natural products industries, and evaluate the success of the practices in terms of enhancing or preserving natural resource values.

c. Cooperative agreements. Identify existing cooperative agreements on use, preservation, and conservation of natural resources, including recreation, and indicate requirements for resource management (see subsection G).
d. Identify agreements with land owners and indicate requirements for resource management (see subsection G).
e. Resource management coordination.

(1) Identify potential conflicts among natural resource management plans, cooperative agreements, and agreements with landowners

(2) Determine effect of natural resources management plans on the range with the management and use of surrounding areas
(3) Determine effects of pest management, weed control, and fire prevention practices on natural resources management

f. Identify public health aspects of the natural environment and determine their importance for range use.

3. Rehabilitation. Obtain histories of target locations and other information locating possible ordnance, and determine the feasibility of future rehabilitation for mission use areas

4. Integrating Resource Management and Mission Requirements. Identify potential areas of conflict between mission use and maintaining various ecological resource areas and qualities for each of the following:

a. Ecological resources
b. Economic resources
c. Natural products industries
d. Cultural resources

VI. COMMUNITY/GOVERNMENTAL CONTEXT

A. Characterization

The objective of this planning element is to identify the relationship and compatibility of Air Force range plans and objectives with the plans and objectives of local communities and governmental agencies. Major subelements include land use, community relations, and intergovernmental coordination.

The element will contain descriptive materials and maps identifying land use and zoning conditions for the areas adjacent to Air Force range lands. Existing and potential land encroachment areas will be identified and described. In addition, areas within local communities that have complained about Air Force noise disturbances, and areas where Air Force accidents and incidents have happened, will be located.

Local, regional and state plans and programs that may potentially compete with the use of range lands (e.g., area comprehensive plans, highway plans, power transmission plans, zoning revisions, recreation plans, water supply, utilities, sewage, solid waste disposal, communications, housing, community service, and others) will be identified and evaluated. The element will also describe the socioeconomic value of continued range operation to the local community in terms of employment, salaries, direct Air Force support, outleases, recreation, transportation, and other factors. The element will also deal with the issues of participatory planning, and with channels of communication with the local community. It will identify existing and potential opportunities for dialogues with local communities, local governments, and civic organizations under current Air Force guidelines. It will also describe public information programs related to Air Force range activities.

Using the information contained in Tab A-1 and other data sources, this element will identify anticipated future population and land uses in the vicinity of Air Force ranges, and will analyze the relationships between these changing land use patterns and Air Force mission requirements.

The element will also identify mechanisms for intergovernmental coordination, and will outline mechanisms of coordination with DoD and non-DoD agencies including local, regional, and federal agencies (e.g., FAA, BLM, Department of Fish and Wildlife, Local Public Works, planning departments, state planning offices, state highway departments, etc.). It will also include a description of the agencies currently involved with the local OMB Circular A-95 review process.

B. Rationale

This range planning element is critical to the comprehensive planning process in that it brings many of the requirements and issues of the external, non-Air Force world into the planning process. Specifically, this element will identify community plans and programs, existing and future land development patterns that may cause land encroachment problems and other range limitations, review and approval processes of other regulatory agencies, and, in general, identify the compatibility of Air Force range plans and objectives with those of local, regional, and state planning agencies.

C. Use of This Element at Various Levels of Command

1. HQ USAF

This element would be a valuable planning tool in describing and identifying community issues and socioeconomic data related to Air Force range activities. This information would be valuable in planning for new missions and in the modification of existing ones. The element would also identify the inter-governmental issues relative to specific Air Force ranges at local levels.

2. MAJCOM

This element would identify community issues and intergovernmental factors for use by Major Commands in the planning and coordination of Air Force ranges. It would deal with the socioeconomic issues relative to the expansion or closure of existing ranges. It would also be a valuable tool in planning for linkages among existing ranges for mutual benefits.

3. Bases

This element will be extremely valuable to base commanders and base planners as they work with existing communities and community planning organizations. It will provide the data on community plans and programs (e.g., utilities, transportation, housing, services, etc.) that may influence Air Force range missions. It will also identify the local governmental context within which range activities occur - including OMB Circular A-95.

4. Ranges

This element will be valuable to range commanders in the day-to-day operations of range activities. It will identify community interface issues, compatibilities and conflicts with community programs and objectives, potentials for community support (e.g. housing for range personnel at remote sites), and related information. It will identify community interests in the current and future use of Air Force range lands, and current community issues related to the natural resources of the Air Force ranges.

D. Outline of Subelements

1. Land Use

a. Current land use. Identify principal land use within 5 miles of the range and under range airspace
b. Regional development

(1) Identify existing plans and programs for the development of surrounding regions at local, county, state, and regional levels
(2) Identify from these plans, etc., projected needs for housing, recreation, industry, open space, and transportation and utilities corridors in the civilian community and potential relationship to rangelands
(3) Determine the expected future civilian population, transportation, and use of the range and vicinity, and the relationship of this changing pattern of use of the range lands and vicinity to Air Force mission requirements
(4) Inventory local, regional, state, etc., developmental regulations, zoning ordinances, coastal regulations, etc., governing land use in the range region

c. Effects of planned development

(1) Determine whether present and anticipated land uses and zoning near the range, and under range airspace,

are compatible with continued present and anticipated future mission use, using RACUZ descriptors wherever possible.[a]

(2) Compatibility of development. Determine the compatibility of plans and programs of other agencies with continued and future use of the range
- Water supply
- Roads
- Utility
- Sewage
- Solid waste disposal
- Communications
- Land uses/zoning
- General plans
- Housing
- Community services
- Other

2. Local Community Relations

a. Determine the degree of potential common interests with the local community[b]

(1) Determine the socioeconomic value of continued base/range operation (payroll, retail sales, local purchases by Air Force, etc.)

(2) Evaluate the importance of range lands to local community for reasons other than range operation (e.g., transportation, outlease, recreation, attraction of tourists, etc.)

(3) Indicate direct support by Air Force of local community (community services, Boy Scouts, Little League, pancake breakfasts, etc.)

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[a]The RACUZ program will provide noise, accident, and ballistics descriptors. The Range Planning Document will apply these descriptors in the comprehensive planning process and develop compatible land uses.

[b]As a basic rule, Air Force personnel should be cautioned against the use of "hard sell" tactics in their relations with local communities.

b. Conflicts

(1) Determine potential areas of conflict
(2) Inventory local complaints handled through the OI and potential areas of greatest future concern

c. Determine potential tradeoffs
d. Indicate channels of communication with the local community under current Air Force policies

(1) Opportunities for dialogue with communities (participatory planning)
(2) Communication and coordination with local city councils and local governments
(3) Public information programs (to show why/what AF is doing that causes booms, etc.), briefings to community and civic organizations, open houses, base tours

e. Evaluate the impacts, if any, of future mission changes on the community and community relations

3. Intergovernmental Relationships

a. Outline mechanisms of coordination with DoD and non-DoD agencies including local and regional agencies, FAA, BLM, Department of Fish and Wildlife, Local Public Works Department, Planning Departments, State Planning Offices, State Highway Departments, OMB, etc.; A-95 review process
b. Identify potential range problem areas stemming from interactions with other public agencies
c. Determine potential effects of mission changes on intergovernmental relationships

VII. LEGAL/LEGISLATIVE CONTEXT

A. Characterization

The objective of this range planning element is to describe the legal and regulatory context under which the range currently operates. Major subelements include evaluations of land use agreements and outleases, potential liability from various Air Force activities, and the effect of future missions on existing land use agreements. A final subelement will identify legislation relevant to planning.

The element will identify existing legal constraints such as local, state, and federal laws that interact with range planning and operations. The element will also include an inventory of local, regional, state, and federal developmental regulations, such as zoning ordinances, coastal regulations, NEPA, OMB Circular A-95 review process, and other legal requirements. It will also focus on existing and proposed agreements with land owners, and the terms and conditions of these agreements, together with the schedule for renewal of these agreements (e.g., BLM land withdrawals, etc.). The element will identify existing and future needs for continued leases and land withdrawals based upon Air Force existing and future mission needs and requirements. It will also identify existing and proposed outlease areas and activities including grazing, forestry, easements, and other potential revenue producing activities. This element will also identify current water rights, mineral rights, surface and subsurface land rights, legal rights of special groups such as Indian Nations, and other related legal constraints on the land.[a]

B. Rationale

This range planning element will deal with the legal and regulatory requirements and constraints on Air Force range activities. In this sense it forms the legal context within which Air Force range activities must function, and, therefore, this element provides a valuable input into the range comprehensive planning process.

Since the Air Force does not have ownership and control over all of its range lands, it must operate within a long series of agreements with

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[a]The intent here is simply to list the current understandings regarding these rights, not to attempt legal interpretations.

land owners, cooperative agreements with state and federal agencies, and agreements with various sorts of tenants. In addition, the Air Force may prove to be liable for accidents and other activities related to range use. Failure to consider any or all of these factors can lead to loss of time and money, and therefore these factors are important elements in the development of range comprehensive plans. This element will accomplish two aims: first, to identify and describe legal constraints on range operations; and second, to incorporate these into the range planning process.

C. Use of This Element at Various Levels of Command

1. HQ USAF

This element will serve as a valuable tool for HQ USAF staff in its real estate negotiations with non-DoD agencies (e.g., BLM, Forest Service, etc.), and will identify the terms and conditions for all agreements with land owners of Air Force ranges. It will also identify regulatory and other constraints (e.g., mineral rights, water rights, rights of Indian Nations, etc.) for use by Air Force range planners. The element will identify issues related to NEPA and other environmental legislation. It will stipulate the terms and conditions of outlease programs, and their relation to Air Force missions. The element will also identify existing and potential legal liability issues related to Air Force range activities.

2. MAJCOM

This element will serve as a guide to the legal context of Air Force ranges and range activities. It will be useful to Major Commands in the coordination and planning of range use and mission activities. It will identify the rights of others involved with the ownership, control, and use of Air Force ranges.

3. Bases

This legal element will be valuable in dealing with local public agencies, land owners, tenants, and lessees. It will identify the regulatory framework and constraints under which range activities must function. It will provide useful data and information in coordination with local planning agencies, and for Air Force public information programs.

4. Ranges

This element will be valuable to Air Force range commanders in describing specific terms, conditions, and requirements of leases, withdrawals, and other agreements for the use of Air Force ranges. Full recognition of the terms of these agreements, which include factors such as transportation corridors, easements, grazing crossings, timbering rights, recreation use, maintenance of fences, tenants, and other issues, is critically important to effective planning for range missions.

D. Outline of Subelements

1. Land Use Agreements

a. Agreements with land owners. Review agreements with land owners (private, state, other federal agencies) and summarize and identify the following:

(1) Obligation to manage resources
(2) Restrictions on land use
(3) Provisions for access by owner
(4) Limitations on future mission use of lands
(5) Conditions for continued withdrawal and present expiration dates

b. Cooperative agreements. Indicate restrictive terms of agreements with federal and state agencies; identify elements of cooperative agreements that limit future mission use of land for these types of cooperative agreements:

(1) Soil conservation
(2) Water conservation
(3) Grazing management
(4) Cropland management
(5) Forestry management
(6) Fire control
(7) Fish and game management
(8) Outdoor recreation

c. Existing rights to land use. Determine the extent of the following and indicate any use or planned use in these connections; identify present and imminent exercises of rights to land use that may have an impact on future mission use:

(1) Indian rights
(2) Mineral/oil rights, mining claims
(3) Water rights
(4) Other

2. Outleases and Outgrants of Range Lands

a. Existing outleases. Identify any limitations and agreements on land and airspace use, and on the range area involved, for outleases, and indicate compensation and term of agreement; identify restrictions on future use of outleased lands for these types of leases:

(1) Leases to other DoD groups
(2) Leases to other federal agencies (ERDA, etc.)
(3) Leases to private individuals for forestry, grazing, etc.
(4) Leases to state and local groups for recreation, etc.

b. Access corridors

(1) Existing corridors. For each of the following types of access or transportation corridors, indicate the route and area involved, the type of materials/persons involved, and provisions for access for repairs and maintenance of the corridor. If appropriate, indicate seasons of use.

- Utility corridors
- Minerals pipelines
- Transportation corridors (air, ground)
- Grazing corridors

(2) Planned and anticipated corridors. Identify safety zones required for future access or transportation corridors

3. Liability. In coordination with local Judge Advocates, identify potential for harm or damage to individuals or groups arising from mission-related accidents and normal range land uqe. Determine potential liability for accidents resulting from past or current mission use of land and/or airspace, including handling of live ordnance for accidents befalling these types of persons:

a. General public under permitted entry on controlled access land
b. General public on range lands having no actual or implied access barriers (fences, signs, etc.)
c. Leaseholders or their agents on leased land
d. Persons exercising acknowledged interests in range lands (repair crews on pipelines, mineral exploration crews, etc.)
e. Contractors, including persons engaged in ordnance removal
f. Trespassers and vandals
g. Non-Air Force emergency personnel
h. Licenses

4. Future Missions. Evaluate the changes in any of the above arising from changes in missions or from new missions.

5. Legislation. Identify NEPA and other laws, policies, regulations, and guidelines at federal, state, and local levels that have an impact on AF ranges.

VIII. RANGE ADMINISTRATION

A. Characterization

The objective of this element is to administer range activities, to identify range management and implementation procedures, and to develop effective implementation tools for future missions. Major subelements include description and analysis of organization and coordination, planning, and implementation guidelines, the implementation process, and range performance data. A summary of supplemental funding sources is also included. This element will identify the chain of command and organization of range facilities and manpower, and the range decision process, including existing guidelines and mechanisms for maintaining an up-to-date, efficient, and cohesive range operation. This planning element will identify implementation and funding procedures. Included will be procedures for range facilities, equipment, improvements, maintenance, and other implementation needs. Procedures for improvement requests, the establishment of priorities, approvals, and funding will be identified, together with decision and command approval procedures for the specific range. Income-producing outleases, sales, and other revenue-producing activities related to the range will be identified, together with the amounts received and the use of these funds. The planning element will describe procedures for continuity of range operations and management processes during changes in range command personnel.

B. Rationale

Range administration performs two vital roles in the conduct of range missions: it provides the organization required to conduct the missions in a timely and efficient manner, and it provides the mechanism for identifying, acquiring, and preparing for future missions and for continuing to conduct present missions within the context of ever-improving hardware and techniques. Range administration also provides the mechanism for implementing recommendations from the range planning process. Range administration provides a key element in the overall planning process because the plan must be attuned to the implementation machinery for it to be useful.

Present-day range administrations are in a state of flux as a result of recent emphasis on range programs. Organization varies considerably from range to range as a result of differing range roles and other factors. The virtues and deficiencies of each type of organization

must be evaluated to assure the most effective response of the Air Force to changing and increasing internal and external pressures.

C. Use of This Element at Various Levels of Command

HQ USAF and All Other Levels of Command

This element deals with all administrative issues related to range missions and activities. These include improvement priorities, budgeting, implementation programs, reporting activities, and related functions. This is an essential information and data-providing element that will be valuable for Air Force range planning and decision making.

D. Outline of Subelements

1. Organization and Coordination

   a. Describe range management organization and chain of command from range to HQ USAF levels
   b. Identify overlap with and links to home base chain of command
   c. Identify potential changes in management organization to expedite existing missions
   d. Describe process for overall coordination of range activities

      (1) Describe process for integrating various range uses
      (2) Describe process and guidelines for assessing compatibility of new missions or tasks with existing range uses
      (3) Describe the practice of coordination among several armed services, non-DoD agencies, and contractors for joint or concurrent use of range
      (4) Describe the activities of the Range Commander's Council and its various working groups.

   e. Evaluate effects of future mission changes on coordination process

   f. Self-critique

      (1) Describe pathway for handling suggestions, problems, and complaints from personnel arising during range operation

(2) Indicate the nature of such suggestions and complaints
(3) Indicate recent suggestions or complaints for which implementation is scheduled or anticipated

g. Management continuity

(1) Describe procedures for maintaining operations during changes of key personnel
(2) Identify critical range management policies and methods that must be maintained during changes of key management personnel

h. Identify range data needs and automatic data processing procedures

2. Planning and Implementation Guidelines[a]

a. Identify guidelines for Air Force corporate planning
b. Identify guidelines for major range decisions
c. Describe funding guidelines
d. Describe guidelines for range master plans
e. Describe guidelines for range management plans/resources plans

3. Implementation Process

a. Describe implementation procedures for facilities, equipment, and repairs
b. Describe review and approval process
c. Describe funding process
d. Describe potential needs for new or revised implementation procedures, particularly in light of planned and projected new missions, and review and approval procedures
e. Identify fiscal year phasing for all funding requirements and programs
f. Describe funding requirements to meet future mission needs in terms of facilities, equipment, and repairs
g. Identify cost accounting procedures for range users

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[a]These guidelines may be included in an appendix that lists these and other references.

4. Supplemental Funding Sources

   a. Identify amounts recovered income-producing outleases and sales
   b. Identify use of funds from outleases and sales
   c. Identify potential revenues for subsequent fiscal years from outleases, sales, and other revenue-producing activities[a]

5. Range Performance Data

   a. Describe methods, techniques, and equipment available for the timely collating and presentation or range performance data
   b. Will data be available in a timely manner for future decisions?
   c. Will data be appropriate in level of detail to the level of the decisions?
   d. Identify research and development programs for range systems

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[a]HQ USAF/PRER, MAJCOMs, and bases review requests for non-Air Force use of Air Force ranges. AFR 87-3 identifies specific divisions of responsibility.

IX. RANGE OPERATIONS[a]

A. Characterization

The objective of this element is to activate and coordinate the many components of range operation described in the other elements. Subelements include range scheduling and utilization, logistic support in terms of equipment and facilities, maintenance and supply, safety, security, manpower needs and capabilities, and combined operating ranges. The element will address issues such as range personnel support needs (e.g., housing, transportation and services), scoring and instrumentation requirements, interferences among and between ranges and target areas, facilities needs, air traffic control, radar tracking requirements (e.g., radar gaps), general aviation penetrations, flight accidents, and other related range management issues.

The emphasis of this element will be on the identification and description of the entire spectrum of range conditions and requirements so that the range comprehensive planning process can include a management plan that will protect existing range operations, and provide for future mission needs.

B. Rationale

The range operations element will describe the actual machinery with which the mission is carried out. A full understanding of the processes of range operation is necessary in order to plan for future missions; this element describes the dynamic portion of mission completion. Although planning and implementation techniques have been developed extensively to assure that missions will be completed in a timely and efficient manner, integration of newer and less well-covered areas, such as environmental issues, cannot be done effectively without full and simultaneous consideration of operations and potential impacts on operations. This element will lean heavily on existing manuals, regulations, and other documentation.

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[a]Subsequent study may identify a need to easily separate this element from the Range Planning Document and to replace it for updating purposes.

C. Use of This Element at Various Levels of Command

1. HQ USAF

This element deals with the operating functions of Air Force ranges. It will be a key source of information in the assignment of new range missions and weapons systems.

2. MAJCOM

This element will provide valuable information and data to Major Commands in terms of range scheduling, facilities, equipment, manpower, and other operating factors. It will become a valuable coordinating and range management tool for Major Commands. It will provide useful data for budgeting purposes and for the establishment of improvement priorities.

3. Bases

This element will describe range operations in terms of scheduling, utilization, safety, security, and related functions. It will furnish data for the support activities and budgeting required at base levels. It will also provide valuable information for community planning activities.

4. Ranges

This element will identify the operating procedures and requirements for the coordination and planning of Air Force ranges. In addition, it will provide information for planning modifications of range operating procedures. It will include range scheduling, operations, facilities, manpower, equipment, safety, security, and support factors, and other related range operations functions.

D. Outline of Subelements

1. Scheduling of Range Operations

a. Present scheduling

(1) Identify anticipated time available for mission use
(2) Indicate why range will not be available during any time periods (hours or day, days of week, etc.) not included in (a) (e.g., maintenance, EOD cleanup, recreation, etc.)
(3) Indicate the extent to which the range can be used jointly (simultaneously) by different missions
(4) Describe priorities for use of range

b. Range scheduling problems

(1) Describe range maintenance schedules
(2) Identify set-up and knock-down time for the following and indicate which factors contribute most to these times:
- Daily
- New mission
- Sortie
(3) Identify nonrange (or adjacent range) uses scheduled in range scheduling office that are not compatible with range use
(4) Identify events that are not under control of the range scheduling office and that are not compatible with range use
(5) Indicate anticipated time losses due to weather and visibility problems, and indicate the critical factors that preclude range use
(6) Identify potential scheduling difficulties arising from planned and projected missions and their sources

c. Carrying capacity

(1) Determine the critical factors and thresholds in range carrying capacity for:
- Joint use
- Time between missions
- Set-up time
- Maintenance and equipment
- EOD
- Weather
- Air traffic control
- Conflicts among ranges
- Conflicts with non-Air Force uses
- Other

(2) Determine the critical factors limiting the effective work day, work week
(3) Identify the critical factors in supporting visiting units during a training exercise
(4) Limitations on future range use:
- Remoteness (housing, transportation, on-range facilities for support personnel)
- Interference (among ranges, between base and range, between other airspace use and range, between ground use and range)
- Facilities (scoring, tracking planes, utilities)
- Distance from user groups
- Distance from airfields

2. Safety[a]

a. Guidelines. Identify appropriate base/range/AF regulations and any written/unwritten guidelines for continued safe range operations
b. Flight safety

(1) Air traffic control
- Identify operation procedures
- Identify guidelines for scheduling airspace
- Describe mechanisms for coordination with FAA
- Describe local capacity for air traffic control and mechanisms for coordination with regional air traffic control network
- Identify present mechanism for tracking aircraft on the range
- Aircraft holding capacity on range

(2) Existing and future air traffic control problems
- Potential problems with obtaining clearance for flights from regional control facilities; saturated computers, controllers, etc.
- Identify potential range tracking problems such as radar gaps
- Indicate the rate of intrusion by private pilots and whether there is an increasing trend indicating a problem becoming more severe

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[a]Safety is not a primary objective of range operations, but is the result of proper range planning and operations.

- Indicate future procedures for dealing with private pilots, particularly ones with no radio contact

(3) Flight accidents
- Describe the frequency of plane losses and their locations
- Describe the frequency and location of accidents involving off-target impact, dropped objects, or inadvertant ordnance expenditures
- Identify procedures for identification of target versus non-target locations (including off-range)
- Identify sources of gross errors resulting in accidents, such as system malfunction, ordnance arming/release malfunction, crew error, etc.

(4) Analysis of flight accidents
- Potential for increase in problems (as equipment and scenarios increase in complexity, so do opportunities for mishaps)
- Evaluate adequacy of present methods for identifying future non-target areas and range boundaries
- Evaluate present and future problems with EMI

(5) Briefing. Procedures for briefing air crews; in particular for identifying target areas and recognizing non-targets

(6) Identify bird-aircraft strike hazard (BASH) and procedures

c. Ground Safety

(1) Procedures for identifying hot zones and keeping personnel out of these zones during use periods
(2) Procedures and briefings for manned ranges
(3) Procedures for maintenance in hot zones
(4) Remotely - piloted vehicles

d. Explosives

(1) EOD procedures
(2) Frequency and scheduling of cleanups
- Wall-to-wall
- Mission-to-mission
- Day-to-day
- Wayward ordnance

(3) Frequency and location of incidents involving ordnance encountered on the ground

e. Emergency procedures

(1) Runaway gun
(2) Hung ordnance
(3) Downed aircraft
(4) Fuel tank release
(5) RPVs

f. Fire control

(1) Procedures
(2) Coordination of fire control with other agencies/facilities
(3) Procedures for operation in live ordnance areas
(4) Fire prevention/containment procedures while using live ordnance and other incendiary technology

3. Equipment and Facilities Maintenance

a. Describe maintenance programs

(1) Daily and monthly status reports
(2) Age of equipment
(3) Damage repair and preventive maintenance frequency
(4) Supply process

b. Describe potential problems with existing equipment

(1) Old equipment with limited parts and servicing availability
(2) Inadequate/insufficient equipment/vehicles for operations

c. Equipment adequacy

(1) Adequacy for testing
(2) Adequacy for training programs

4. Security[a]

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[a]Some source documents will be classified.

a. Control of entry and use

(1) Authorized entry
- Identify areas open to the general public
- Identify times these areas can be used
- Identify uses that are authorized
- Identify procedures for entry control
- Identify entry points and guidelines for sentry duty
- Identify fenced areas and guard houses and warning signs
- Identify security patrol procedures and patrol intensity

(2) Extent of authorized use of range lands
- Is authorized use increasing?
- If authorized use is increasing, does this indicate an increased need for security personnel and access control facilities?

(3) Authorized use and mission. How are present non-mission use levels related to maximum levels compatible with mission objectives?

(4) Unauthorized entry[a]

- Frequency and objectives
  - How often do unauthorized persons enter the range?
  - What times of the week/day are most often used?
  - What is the principal object of the trespassers: hunting, ORV use, grazing, curiosity, theft, vandalism, other recreation, etc.?
  - What is the frequency of fence breakage?

- Cost of unauthorized entry
  - What is the type, frequency, and cost of vandalism? Fence breakage?
  - What is the type, frequency, and cost of theft?

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[a]Some of this information may not be publically releasable.

- Extent and nature of injuries to vandals or trespassers while on range land

• Detection and control
  - What means are available to detect trespassers (radar or TV surveillance, patrols, etc.)
  - What are present arrangements to minimize theft and vandalism to equipment left on the range between use periods?

(5) Analysis of unauthorized use of range lands
  - Are existing fences and warning systems sufficient to prevent unknowing entry into dangerous areas?
  - Are trespass, vandalism, and theft increasing with time? If so, do projections indicate that present controls need to be upgraded? Is upgrading of controls cost-effective in terms of actual losses of equipment, mission delays due to equipment down time, or liability for injury to trespassers?

5. Personnel

a. Types of employees. Give the number of employees by type (civilian, military) for each location:

(1) Range personnel stationed at the base
(2) Personnel at the range

b. Working conditions

(1) Describe working conditions
  - Reporting point
  - Transit time to work location from reporting point
  - Working hours and scheduling
  - Support facilities at work site or vicinity, including housing, meals, and transportation

(2) Describe problems and conflicts arising from distance to work location, housing, meals, etc., and project future problems due to mission changes

c. Limiting conditions of work (civilians)

(1) Identify limiting conditions
- Work contracts
- Uniforms

(2) Indicate present or future requirements for overtime or double shifts to maintain range availability
(3) Indicate present or future problems due to inflexibility of hours and schedules for civilian personnel

d. Personnel management. Indicate:

(1) Qualifications of range personnel
(2) Personnel replacement procedures
(3) Future qualifications requirements

6. Coordinated Use of Multiple Ranges

a. Describe procedures for integrating range with other range complexes (e.g., joint scheduling programs or block scheduled times arranged for joint use)
b. Determine how frequently such multiple range use is made
c. Obtain projections for future multiple use of ranges
d. Indicate the extent to which future multiple range use is compatible with local mission use of range, including schedules, mission substitution, varying service requirements, and other considerations.

SECTION V

CURRENT AIR FORCE RANGE PLANNING PROGRAMS

Many of the range planning activities and functions described in the previous section of this report are currently being accomplished by Air Force personnel with range responsibilities. However, significant gaps in the existing range planning process threaten the continued mission effectiveness of Air Force ranges.

Current Air Force programs address the areas of range missions, capabilities, operations, air space, and land requirements. Air Force range planning programs also recognize and address the legal requirements that govern the land used for range activities, as well as environmental and other regulatory legislation.

Range administrative functions for the planning, budgeting, and improvement of range facilities and equipment emphasize existing procedures for approvals and funding (e.g., through Base Civil Engineer functions, Facilities Board, Military Construction Program, etc.). However, continuity in range management and planning programs over time, and in relation to changes in range personnel, is not clearly defined. In addition, use of range land and airspace under existing host-tenant agreements should be evaluated for optimum use of internal resources.

Air Force range planning programs are currently beginning to address natural resource issues related to range land and air space activities. Recent environmental legislation, changing terms and conditions for the continued withdrawal of lands in the public domain (e.g., BLM lands, Forest Service lands, etc.), and public inquiries about alternative or multiple uses of Air Force bases make it imperative that sound scientific information be developed on the natural resources contained in these lands. For this purpose the ecological, cultural, and natural resources inventories that are part of the natural resources element will become critically valuable information for Air Force decision makers and planners.

Currently Air Force range programs have little interface with local communities and local public agencies. As a consequence, serious land encroachment issues already exist at key Air Force ranges, and the

potential exists for many additional conflicts between Air Force range plans and programs and the programs of local communities and public agencies. The community/governmental element of the range planning document will provide necessary information on local community plans, programs, and issues for use by Air Force range commanders and planners.

RANGE COMPATIBLE USE ZONE (RACUZ) PROGRAM[a]

The RACUZ program is designed to describe the impact of Air Force range operations. Its objective is to develop those descriptors necessary to depict the scope of air operations on Air Force air-to-ground ranges. The RACUZ descriptors include the following:

1. Noise profile descriptor: This includes the modification of the existing AICUZ computer program for range operations to include supersonic maneuvering and ordnance blast.

2. Accidental impact descriptor: This will be a graphic plot of the location of reported air-to-ground aircraft and ordnance accidents.

3. Ballistic footprint descriptor for unguided ordnance: This will be a graphic and statistical plot of the areas of probable containment for non-propelled ballistics ordnance.

These descriptors are currently in the final process of development. The noise and accidental impact descriptors will be available for planning use in the near future. The ballistics footprint descriptors will be improved to include ordnance programs anticipated for use on Air Force ranges, and will be available as they are developed over the next years. These descriptors will provide valuable planning tools in the Air Force range planning process.

Similar to the Air Installation Compatible Use Zone (AICUZ) planning system, the RACUZ system will permit the establishment of compatible land uses that reflect the potential hazards and other factors identified in the RACUZ descriptors.

COMPREHENSIVE RANGE PLANNING

Many of the proposed range planning subelements described in this report have been or are being developed by Air Force range personnel. However, no comprehensive range planning process currently coordinates,

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[a]It should be noted that the RACUZ program is not currently fully operational.

manages, and integrates these diverse range activities and functions into an interrelated planning and decision-making process. In the past, since comprehensive range planning had not been established as a requirement, range activities have been accomplished in an uncoordinated and incremental manner in accordance with the directives existing at the time. As a result, range use and mission performance are sometimes less than optimal. This synthesis and coordination of the diverse range activities into an effective range planning tool is essential to meet the needs of current and future Air Force range missions. The Range Planning Handbook will provide this range planning methodology, along with the step-by-step implementation process.

CURRENT AIR FORCE PROGRAMS RELATED TO THE PROPOSED RANGE PLANNING ELEMENTS

The following identifies certain Air Force programs, currently under way, that will be useful in the development of an Air Force range planning methodology. These programs are described under the heading of the appropriate proposed range planning elements in which they would function. These existing programs can be built upon, and modified where required, to include the needs of Air Force range planning. These programs include the following.

1. Range Missions

AFM 50-46 establishes range standards and criteria and will be valuable in the range planning methodology. In addition, AFR 55-2 is valuable for air space management in relation to range activities and missions. Special adaptations of these documents by Major Commands such as the Tactical Air Command Range Management Plan, April 1976, and the AFFTC Users Handbook, 1 June 1973, will be useful tools in developing an Air Force Range Planning Handbook. The Program Introduction Document (PID) AFR 90-14, which describes new testing programs and missions at Edwards Air Force Base, California, will also be quite valuable.

2. Capabilities

Planning documents such as the "Statement of Capabilities," AFR 80-14, prepared at Edwards Air Force Base to support specific proposed missions, will be useful in identifying the capabilities of Air Force ranges for specific mission assignments or modifications to existing ones.

3. Land Requirements

Existing Air Force procedures for master planning (as improved under the current Base Comprehensive Planning contract), and related procedures.

for approvals, funding, and implementation of facilities improvements are outlined in AFR 86-1, AFM 86-6, AFM 86-8, and AFM 86-9. These procedures form the basic steps for current Air Force planning programs. AFR 85-10, AFR 91-26, and the AFR 87 series, also provide guidance on the operation, maintenance, management, and disposal of real property.

In addition, the current planning program developed at the Air Force Flight Test Center (AFFTC) for the expansion of their PIRA range provides an excellent base for subsequent range planning. As described above, the existing AICUZ and RACUZ programs will also serve as excellent foundations for land use and zoning programs.

4. Airspace

Existing Air Force programs of close and continual coordination with the Federal Aviation Administration (FAA) are extremely valuable and essential to the range planning process. In addition, AFM 86-8 "airfield and airspace criteria" provides a basis for planning for future airspace needs. Other planning programs such as those developed by AFFTC for flight safety planning, range operating procedures, scheduling procedures, and procedures for supersonic flights are important elements of the range planning process.

5. Natural Resources

Existing Air Force programs, such as those outlined in AFR 19-1 and 19-2, establish procedures for maintaining environmental quality on Air Force ranges. In addition, AFM 126-1, which deals with the conservation and management of natural resources, provides a basis for the natural resources element of the range planning methodology.

The procedures described in the "Handbook for Environmental Impact Analysis,"[a] provide an excellent system for describing environmental and natural resource attributes, and means for their measurement and evaluation. Other natural resource and environmental programs include AFR 215-1 Outdoor Recreation Program. In addition, the Air Force has had private contractors study the natural resources on several Air Force ranges. These studies will be quite valuable in the development of the range planning methodology. Other natural resources plans that will serve in the development of the range planning methodology include:

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[a]"Handbook for Environmental Impact Analysis," Interim Environmental Planning Bulletin #11, June 1976, USAF/PREV Environmental Planning, Washington, D.C.

- Eglin Air Force Base, Florida, Comprehensive Natural Resources Plan, March 1973.

- Management Plan for the Conservation and Management of Fish and Wildlife Resources, Avon Park Air Force Range, Florida, July 1973 - July 1978.

- Outdoor Recreation Plan, Edwards Air Force Base, California, December 1976.

- Cooperative Agreement for the Operation, Development, Management, and Protection of Outdoor Recreation Resources at Eglin Air Force Base, Florida, 1977.

6. Community

OMB Circular A-95 and the Intergovernmental Cooperation Act outline procedures for the review and coordination of programs by various federal agencies. In addition, ongoing Air Force studies, including the Base Comprehensive Planning study, livability study, and Air Force programs such as the Economic Impact Forecast System for the inclusion of socioeconomic changes in environmental assessments, will also be extremely useful. In addition, procedures described in the National Environmental Policy Act (NEPA) and in other regulations recently enacted by many states, outlined the steps necessary for planning in these areas.

Other valuable Air Force studies include the one prepared by Benham-Blair-Winesett-Duke, Inc., et al., "Air Force Environmental Planning Process Study," Parts I-IV, 1976. In addition, the procedures outlined in Tab A-1, Environmental Narrative (Phase II), HQ USAF/PREV, 11 September 1975, and those procedures in AFM 86-9, Statements of Work for Master Planning, 15 November 1966, will be valuable data sources. In addition, Air Force policy on community planning is established in the AF/CC letter of May 1975, "Air Force Environmental Planning."

Community planning issues are also described in "Air Force Land Use Planning" by Gary D. Vest, HQ USAF AF/PREE, Washington, D. C., Planning Task Force, January 1974, and "In Search of an Aviation Environment Master Plan," Air University Review, Department of the Air Force, Maxwell Air Force Base, Alabama, September-October 1969, authored by William R. Sims and Angelo J. Gerchione.

7. Legal

Local Air Force Judge Advocates deal effectively with legal issues related to Air Force range activities, and the procedures to be followed

in dealing with them. In addition, Air Force regulations dealing with leases, withdrawals, and other real estate issues--including those related to tenants--are also described in Air Force documents dealing with real estate such as the AFR-87 Series, Real Property Management. These programs will be highly valuable in the development of an Air Force range planning methodology.

8. Range Operations

AFM 50-46 establishes general guidelines for range operations. In addition, AFFTC OI 55-2 establishes operating procedures for the PIRA range at Edwards Air Force Base, and will be useful in developing range planning tools. Other documents such as AFFTCR 55-15 establish procedures for scheduling aircraft and air/ground support. Other supporting Air Force documents outline procedures for safety, security, supply, and related range operations factors.

9. Ordnance

Existing Air Force procedures dealing with explosives handling and storage and related safety factors will be useful in the range planning methodology. In addition, established safety procedures for the decontamination of Air Force ranges by EOD personnel, such as AFFTC OI 127-6, which deals with the AFFTC PIRA decontamination procedures, will be useful.

CONCLUSION

From the above listing it can be seen that Air Force procedures and regulations now in effect can serve as basic tools in the development of an Air Force Range Planning Handbook. These ongoing Air Force programs will be further evaluated for their application to the development of an Air Force range planning methodology during subsequent tasks of the range planning program. In addition, methods for managing and coordinating the many current Air Force range programs will also be developed during these subsequent tasks. All new range planning programs developed as part of the Range Planning Handbook--including implementation and management procedures--will be refined and tested for their effectiveness before inclusion in the final Air Force Range Planning Handbook.

APPENDIX A

LIST OF INDIVIDUALS INTERVIEWED AND BRIEFED AS PART OF THIS STUDY

7-8 SEPTEMBER 1977, AT WOODWARD-CLYDE CONSULTANTS, SAN FRANCISCO, CALIFORNIA

Donald J. Armstrong, Capt.	Det. 1 (CEEDO) HQ ADTC/ECA
James A. Baker	6510 ABG/DEEE
Charles Bigelow	Woodward-Clyde Consultants
Allen H. Ebeltort, Lt. Col.	AFFTC/DOETR
Robert D. Glynn, Jr.	Woodward-Clyde Consultants
Roy E. Gustafson	6510 AGB/DEPD
Jerry T. Lang, Capt.	OL-AA, USAF OEHL
William H. Liskamm	Woodward-Clyde Consultants
James Sartor	Woodward-Clyde Consultants
Thomas Spight	Woodward-Clyde Consultants

12 SEPTEMBER 1977, HQ TAC

Donald J. Armstrong, Capt.	CEEDO/ECM
John J. Coughlin, Lt. Col.	HQ TAC/SG
James D. Franks, Capt.	TAC/SEP
Brad Grems, Maj.	CEEDO/ECA
William H. Liskamm	Woodward-Clyde Consultants
Ernest W. Looney	TAC/DEMM
Tom Lord	TAC/DEEV
Tom M. Spight	Woodward-Clyde Consultants
T.L. Van Petten	TAC/DORW
J.T. Yonkos, Maj.	TAC/DEEV

13 SEPTEMBER 1977, HQ AFSC

E.E. Lagimoniere	HQ AFSC/DEPD
S. Valder, Maj.	HQ AFSC/

13-16 SEPTEMBER 1977, NON-DoD AGENCIES, WASHINGTON, D.C.

W. Evans	U.S. Forest Service
J. Fox	U.S. Dept. of the Interior
Al. Hidlebaugh	Soil Conservation Service, Dept. of Agriculture
Christine McElliott	Environmental Quality Office, Community Planning and Development
R.K. Miller	Bureau of Land Management
Paul Opler	Office of Endangered Species
John Pulliam	U.S. Dept. of the Interior
W. Russell	U.S. Dept. of Agriculture
J. Schmatz	U.S. Dept. of Agriculture
Michael E. Shapiro	Acting Chief National Policy U.S. Dept. of Commerce National Oceanic and Atmospheric Administration
R. Smith	Bureau of Outdoor Recreation U.S. Dept. of the Interior
R. Springer	U.S. Dept. of the Interior
Dan Stiles	Fish and Wildlife Service U.S. Dept. of the Interior

14 SEPTEMBER, HQ USAF

Donald J. Armstrong, Capt.	CEEDO/ECM
Bayer, Maj.	HQ USAF/PRPOA
Ervin J. Bedker	AF/PREV
Arthur P. Hahn, Lt. Col.	PREVX
Lewis E. Jones, Maj.	HQ USAF/PRPOA
William H. Liskamm	Woodward-Clyde Consultants
Jerry T. Lang, Capt.	USAF/OEHL, Kelly AFB TX
Richard B. Myers, Maj.	AF/XOODE
Personius, Lt. Col.	HQ USAF RDXT
William R. Sims, Lt. Col.	AF/PREVX
W. Smith, Maj.	HQ USAF RDXT
Tom M. Spight	Woodward-Clyde Consultants
Charles G. Thomas, Lt. Col.	AF/PRPO
Gretchen Van Hyning	AF/PREV
Edwin L. Winter	AF/PRER

15 SEPTEMBER 1977, HQ AFLC

Lamb, Brig. Gen.	AFLC/DE
Donald J. Armstrong, Capt.	CEEDO/ECM

Don Carroll	AFLC/IGYW
H.J. Huddleston, Lt. Col.	AFLC/IGO
S.E. Kemp, Lt. Col.	AFLC/DEPV
William H. Liskamm	Woodward-Clyde Consultants
John F. Maiorano	AFLC/DEPR
Ben E. Pierce	AFLC/DEP
Thomas D. Schoegler, Maj.	AFLC/XRPM
Martin Shaw, Col.	AFLC/DEM
Forrest E. Storz, Col.	AFLX/XRPM
Richard C. Woodworth, Capt.	AFLC/DEPV

27-28 SEPTEMBER 1977, AFFTC, EDWARDS AFB, CALIFORNIA

Donald J. Armstrong, Capt.	DET 1 (CEEDO) HQ ADTC/ECA
Jim Baker	DEEE
J.S. Burklund, Col.	AFFTC/CV
Paul Chenoweth	DOEES
Ernie Coleal	CA
A.M. Ebeltoft, LTC	AFFTC/DOETR
Getchell	Security Police
Roy Gustafson	DEPD
Howiesner, Capt.	
Robert E. Kellock, LTC	SES
P.D. Kennedy	AFFTC/DOV
Warren Kerzon, LTC	DOETR
Jerry Lang, Capt.	OL-AA, USAF OEHL, Kelly AFB, TX
William H. Liskamm	Woodward-Clyde Consultants
H. McClannan, Capt.	DEE
M.W. Phillips	DOETRC
Charles S. Reid	DOCO
James D. Sanders, Col.	AFFTC/DO
Tom Spight	Woodward-Clyde Consultants
Mark Sutton	DEPD

29 SEPTEMBER 1977, NELLIS AFB, NEVADA

Ashcraft, Col.	
Herbert W. Craig	TFWCRG
Leach, Capt.	
McMillan	
Toth, Maj.	
Wheeler, Col.	

30 SEPTEMBER 1977, NELLIS RANGE

Herbert W. Craig	TPWCRG
William H. Liskamm	Woodward-Clyde Consultants
Ricci, Lt.	Indian Springs Range
Rogers, Capt.	Indian Springs Range
Tom Spight	Woodward-Clyde Consultants
J.T. Yonkos, Maj.	TAC/DEEV

18 OCTOBER 1977, AT WOODWARD-CLYDE CONSULTANTS

Donald J. Armstrong, Capt.	CEEDO/ECA
James Baker	6510 AGB/DEEE
R.D. Glynn	Woodward-Clyde Consultants
Warren Kerzon, Lt. Col.	DOETR
William H. Liskamm	Woodward-Clyde Consultants
Tom Spight	Woodward-Clyde Consultants

APPENDIX B

LIST OF DOCUMENTS REVIEWED

1. AIR FORCE OPERATIONS

AFFTC Test and Evaluation Support Resource Plan, FY 80-84, September 1977. TESRP Vol. I (composite), RCS-SYS-TEU (A)7603. Tactical Air Command Range Management Plan, April 1976.

R-2508 Enhancement Plan (abridged) (excerpts from document of March 1976).

AFFTC Users' Handbook, 1 June 1973.

Base Inspection Questionnaire, SCN 7T 33, October 1976.

Military Standard, System Safety Program Requirements, MIL-STD-882A, 28 June 1977.

2. AFFTC RANGE PLANNING

AFFTC Land Acquisition Briefing (FY-74 MCP 911-146).

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Report on Air, Water, and Land Rights, Air Force Flight Test Center, Edwards Air Force Base, California, 26 May 1972.

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3. ENVIRONMENTAL DESCRIPTION

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Handbook for Environmental Impact Analysis. Interim Environmental Planning Bulletin 11. USAF/PREV Environmental Planning, Washington, D.C., June 1976.

Ecological Study Requirements for Vandenberg Air Force Base, California. Air Force Weapons Laboratory, Air Force Sysstems Command, Kirtland Air Force Base, N.M., July 1974.

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AFR 126-1, proposed draft, 23 August 1977.

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4. NATURAL RESOURCES PLANS

Eglin Air Force Base, Florida, Comprehensive Natural Resources Plan, March 1973, updated August 1974.

Management Plan for the Conservation and Management of Fish and Wildlife Resources, Avon Park Air Force Range, Florida, July 1973-July 1978.

Land Management Plan, Avon Park Air Force Range, Avon Park Auxiliary Airfield, 1 March 1976.

Forest Management Plan, Avon Park Bombing and Gunnery Range, 1971-1981.

5. OUTDOOR RECREATION

Cooperative Agreement for the Operation, Development, Management and Protection of Outdoor Recreation Resources at Eglin Air Force Base, 1977.

Outdoor Recreation Plan, Edwards Air Force Base, California, December 1976.

MWR Programming/Planning. Lt. Col. H.D. Cox, HQ AFSC, Andrews Air Force Base, Washington, D.C., 10 March 1977.

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Memorandum of understanding, October 1966. U.S. Air Force and U.S. Department of Agriculture, Forest Service (for use of Claiborne Range Area).

7. PLANS AND PROGRAMS

Clark, L.T., and McCracken, P.R. An Evaluation of the Bird/Aircraft Strike Hazard, Edwards Air Force Base, California, 18 June 1976. Air Force Civil Engineering Center, Tyndall Air Force Base, Fla. AFCEC/TM-76-3.

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Palmdale International Airport Amended Draft Environmental Impact Statement, Vol. 1. Arthur D. Little, Inc., July 1976.

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8. FOREST SERVICE, USDA

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Erosion Inventory Memos, 1977.

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Endangered Species and Federal Law. U.S. Department of the Interior, Fish and Wildlife Service Fact Sheet 3, August 1976.

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General Regulation No. 1, Amendment No. 6, Classification of Wildlife. State of Nevada, Board of Fish and Game Commissioners, 27 July 1976.

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Fish and Wildlife Service List of Endangered and Threatened Wildlife. 50 CFR 17.11; 40 Fr 44417, September 26, 1975.

National Oceanic and Atmospheric Administration Coastal Zone Management Program Approval Regulations. 15 CFR 923; 40 FR 1683, January 9, 1975.

OMB Circular A-95, revised. Evaluation, Review, and Coordination of Federal and Federally Assisted Programs and Projects.

Prohibition on Certain Uses of Endangered or Threatened Plants, Permits for Exceptions to Such Prohibitions, and Related Items. 50 CFR 17, amended by 42 FR 32374, June 24, 1977.

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AFR 19-1, Protection and Enhancement of Environmental Quality.

AFR 19-2, Environmental Assessments and Statements.

AFR 19-4, Use and Control of Off-Road Vehicles.

AFP 19-5, Environmental Quality Control Handbook.

AFM 50-46, Training Weapons Ranges.

AFFTC OI 55-1, Closure of Highway or Access Roads on Edwards Air Force Base.

AFFTCM 55-2, Air Force Flight Test Center Air Crew Operation Manual.

AFFTC OI 55-2, Precision Impact Range Area (PIRA) Operating Procedures.

AFFTC OI 55-5, Operational Procedures for the Conduct of Spins, Intercepts and Other Routine Operations.

AFFTCR 55-15, Scheduling Procedures for Aircraft and Air/Ground Support.

AFM 85-6, Land Management and Grounds Maintenance.

AFR 85-7, MAJCOM Engineering and Services Organization and Functions.

AFR 85-10, Operation and Maintenance of Real Property.

AFR 86-1, Programming Civil Engineer Resources.

AFM 86-6, Air Base Master Planning Manual.

AFM 86-9, Statements of Work for Master Planning.

AFM 86-8, Airfield and Airspace Criteria.

AFR 91-26, Management and Conservation of Land.

AFM 93-1, Air Force Real Property Accounting Records.

AFM 126-1, Conservation and Management of Natural Resources.

AFR 87-22, Identification of Unneeded Federal Real Property.

AFSC P 127-2, Flight Safety Planning Guide for Flight Testing.

AFFTC OI 127-3, Access Control to AFFTC Precision Impact Area (PIRA).

AFFTC OI 127-6, AFFTC PIRA Decontamination.

AFR 215-1, Outdoor Recreation Program.

APPENDIX C

GLOSSARY OF KEY TERMS

The term COMPREHENSIVE, when used in this report, shall mean that the total scope of the range problems, needs, and operations shall be considered as part of the planning document. The scope is to include such diverse things as security and safety, recreational uses, and operational needs. All activities presented on the range shall be included within the term "comprehensive planning." "Comprehensive" shall also be interpreted to include considerations necessarily and inextricably related to the elements identified in this report.

CORPORATE PLANNING, as used in this report, means planning by and for the many and diverse functional agencies of the Air Force in an integral manner.

The term DECISION-MAKING TOOL, as used in this report, shall mean that this planning document will present to the commander a total program on the various areas covered, the alternatives that were evaluated, and the "recommended plan of action." The decisions recommended by the planners will be those that have been reflected in long-range comprehensive plans contained in the planning document BUT WILL NOT BE BINDING UPON THE COMMANDER. The planner's recommendation will include implementation guidance such as phasing over time, critical decision points, and critical reevaluation points.

The term ELEMENTS, as used in this report, shall mean those activities, functions, descriptors, or considerations that must be a part of the planning process used in preparing a range of planning documents for a document to be truly comprehensive. Examples of these elements might be land use, airspace, utilities, natural resources, etc.

The term FOOTPRINT, as used in this report, describes the impacts of a particular activity on the land. E.g., "noise footprint" means the noise characteristics-noise levels, contours, etc.-caused by a specific activity.

The term HANDBOOK, as used in this report, shall mean a report prepared by the contractor, giving specific implementation guidance to Air Force personnel on the methodology to be used in preparing a planning

document. The handbook shall include the proposed methodolgoy and the "how-to-do-it" guidance for the various steps of the methodology. Based on the handbook that the contractor prepares, planners with five years or less experience, and a typical base civil engineering staff plus specialized assistance from MAJCOM and AFCEC must be able to prepare a range planning document that is comprehensive, releasable to the public, and usable as a decision tool.

The term IMPLEMENTATION PLAN, as used in this report, has two meanings:

1. Instructions and guidance to the range commander and his staff, which, if followed, would result in effectuation of the range planning document. This instruction and guidance would include such things as time phasing of O&M and MCP projects to presentation of the planning document. None of the recommendations in the

   implementation plan would be binding upon the commander or his staff; however, the implementation plan would include a rationale for the proposed action, a description of the desired outcome, and the impact of no action.

2. Recommendations and guidance to MAJCOM and HQ USAF on how to integrate the proposed methodology into the ongoing Air Force range planning process. The recommendations and guidance shall include proposed changes to policy and applicable regulations and manuals.

The term METHODOLOGY, as used in this report, shall mean an outline of procedures to guide the user from point to point along a logical path in developing a range planning document. The methodology is a step-by-step process of "what to do" in planning for use of the air-to-ground range, while the handbook presents the how-to-do-it guidance. This methodology is to be more than a bare checklist, and is to include amplification of the substeps to be taken during each step contained in the methodology, including supporting rationale. The methodology shall be developed to support the Air Force planning and decision making process.

The term OPERATING ENVELOPE, as used in this report, describes the total operating characteristics within which a particular air vehicle funtions (e.g., speed, turning radius, altitude, and other operating characteristics).

The term PLANNING DOCUMENT, as used in this report, shall mean that the narrative and graphic description of the problem and issues facing the range, the recommended planning actions, and the detailed implementation plan have been combined into one planning document. The

planning document is to be prepared through a comprehensive process and is for use by commanders, their staff, and the community in planning for the future of the range and its environs. The document will depict the impact of the range activities on the surrounding environs, thus aiding the public in its planning process to cope with the impact of these long-term projections of the usability of the land and airspace required in air-to-ground range operations, by indicating those land areas outside the installation requiring special zoning, easements, or purchase. The planning document should be prepared in such a manner as to be publicly releasable, in its entirety, and shall be prepared to be used as a decision tool by the range commander, his staff, and the community. The planning process used to develop this range planning document shall be such that the data gathering and data analysis will comply with NEPA's requirements for preparation of an environmental impact assessment/statement (EIA/EIS) or for a negative determination (ND) concerning the operation of the air-to-ground range. The range planning documents recommended actions and decisions shall be accompanied by an EIA/EIS or ND.

The term PUBLICLY RELEASABLE DOCUMENT, as used in this report, shall mean that the planning methodology used to develop the planning document shall ensure that no information contained in the planning document shall preclude release of this document in its entirety to the public. Public release shall mean that it is available to civic leaders, public libraries, and to interested citizens upon written request (at a nominal cost).

The term RANGE, as used in this report, shall mean the total aggregate of all land and airspace necessary for continued operation of all weapon ranges (as described in AFM 50-46, dated 30 June 1972) within any given locale, and generally referred to by a proper name (such as Daire County Range). When referring to individual or ground targets as depicted in AFM 50-46, the term "Weapon Range" shall be used.

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