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Disaster Assistance Programs



A Guide to Federal Aid in Disasters





DISASTER ASSISTANCE PROGRAMS

Federal Emergency Management Agency

Washington D.C. 20472

DAP 19

June 29, 1990

A Guide To Federal Aid in Disasters

Foreword

When disaster strikes or threatens, responsibility for protection, relief, and recovery resides with the individuals and institutions affected, aided by State and local government and volunteer organizations. Under certain circumstances, however, when those resources are not enough, help from the Federal Government can be sought and provided. The President's Disaster Relief Program, managed by the Federal Emergency Management Agency, is the primary means of Federal aid—but not the only one.

This handbook provides some basic information about Federal aid which may be available in a disaster. It is intended to provide a broad overview for the general public. More indepth information on disaster program regulations, policies, and procedures is available from the Federal Emergency Management Agency. (See appendix A of this handbook.)

The provisions of this handbook supersede DAP-19, A Guide to Federal Aid in Disasters, dated March 17, 1987.

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Associate Director
State and Local Programs
and Support Directorate

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I. Introduction

When a disaster threatens or occurs, local authorities take immediate steps to warn and evacuate citizens, alleviate suffering, and protect life and property. If additional help is needed, the Governor may direct execution of the State's emergency plan, use State Police or the National Guard, or commit other State resources as the situation demands. Federal establishments, particularly military installations which are located in or near the disaster area, may provide immediate lifesaving assistance, and voluntary organizations and other Federal agencies, operating under their own statutory authorities, may be able to provide assistance. However, if the situation is beyond the capabilities of local and State forces, supplemented by limited assistance of Federal forces on the scene, the Governor may request that the President declare a "major disaster" or an "emergency." This request must satisfy the provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended by Public Law 100-707 (the Stafford Act).

A *major disaster* is defined as "any natural catastrophe (including any hurricane, tornado, storm, high water, winddriven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby."

An *emergency* is defined as "any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States."

A *State* is defined as a State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, or the Federated States of Micronesia.

The President's Disaster Relief Program is designed to supplement the efforts and available resources of State and local governments, voluntary relief organizations, and other forms of assistance such as insurance. The President's declaration of a major disaster or an emergency authorizes Federal assistance under the Stafford Act and triggers other Federal disaster relief programs as well.

By Executive Order 12148, Federal Emergency Management, and Executive Order 12673, Delegation of Disaster Relief and Emergency Assistance Functions, the President delegated the primary responsibility for administering disaster relief programs to the Director of the Federal Emergency Management Agency (FEMA). The Federal response is coordinated at the national level by the Associate Director, State and Local Programs and Support (SLPS) Directorate, and at the regional level by the Regional Director, through the Disaster Assistance Programs Division.

This handbook discusses the procedure for requesting a major disaster or an emergency declaration; describes what occurs after such a declaration; and lists the various forms of assistance which the Federal Government can make available to individuals, State and local governments, and private nonprofit institutions. It also describes the kinds of assistance available without a Presidential declaration.

Limited additional copies of this handbook and further information on the Disaster Assistance Programs are available from FEMA's national office in Washington, DC, or FEMA's regional office serving your State. (See appendix A for the location of FEMA offices.)

This handbook is for general information only and is not designed to provide details covered in disaster regulations or to indicate the extent or limitations of supplemental Federal disaster assistance pertaining to each major disaster or emergency. More extensive program information may be found in regulations applicable to disaster assistance (see Title 44, Code of Federal Regulations), various program handbooks published by FEMA, the Digest of Federal Disaster Assistance Programs published by FEMA, the National Emergency Assistance Programs guide published by the National Governors' Association, and the Catalog of Federal Domestic Assistance published by the Office of Management and Budget.

II. Requesting a Major Disaster or Emergency Declaration

The Federal Emergency Management Agency monitors developing or actual disaster occurrences. Before, during, and after a disaster, the FEMA Regional Director is in close contact with the Governor's office and the State agency responsible for disaster assistance activities, as well as with Federal agencies having disaster assistance responsibilities and capabilities. When Federal aid is needed, the Governor or State official responsible for disaster operations should contact the FEMA Regional Director for advice and assistance. The Regional Director knows the programs and resources that may be brought to bear in various disaster situations.

If the Governor is considering asking the President to declare a major disaster or an emergency, State disaster/emergency officials, in coordination with other State and local officials, should:

- Survey the affected areas, jointly with FEMA regional disaster specialists if possible, to determine the extent of private and public damage;
- Estimate the types and extent of Federal disaster assistance required;
- Consult with the FEMA Regional Director on eligibility for Federal disaster assistance; and
- Advise the FEMA Regional Office if the Governor requests or intends to request a declaration by the President.

While the Governor may rely on State and local officials for information needed to support the request, only the Governor or Acting Governor can originate the request. The Governor's request for a major disaster must be based upon a finding that the situation is of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments and that Federal assistance is necessary. The Governor must furnish information on the extent and nature of State resources which have been or will be used to alleviate the conditions of the disaster. The request must also contain a certification by the Governor that State and local governments will assume all applicable non-Federal share of costs required by the Stafford Act. It should also include an estimate of the types and amounts of supplementary Federal assistance required. As

a prerequisite to a Governor's request for a major disaster or an emergency declaration, the Governor must take appropriate action under State law and direct the execution of the State's emergency plan.

The completed request, addressed to the President, is sent to the FEMA Regional Director. Suggested formats for such requests have been developed by FEMA and are available from the FEMA regional office. The Regional Director evaluates the damage and requirements for Federal assistance and makes a recommendation to the Director of FEMA, who, in turn, recommends a course of action to the President. For events that do not qualify under the definition of a major disaster, the Governor may request an emergency declaration to provide assistance to save lives, protect property, public health and safety, or to lessen or avert the threat of a catastrophe. The procedures for requesting and declaring an emergency are similar to those for major disaster declarations. As with the request for a major disaster declaration, the Governor's request should contain specific information describing State and local efforts and resources used to alleviate the situation and a description of the type and extent of Federal aid required.

Examples of emergency assistance are: temporary housing, mass care (food, water, medical care), debris removal when in the public interest, and emergency repairs to keep essential facilities operating.

If a request for a declaration or for approval of certain kinds of assistance or designation of certain affected areas is denied, the Governor has the right to appeal.

The President may declare an emergency in the absence of a Governor's request when the emergency involves a subject area for which the Federal Government exercises exclusive or preeminent responsibility and authority. In such a case, although the identification of need may come from a local government or other source, the recommendation must be initiated by the FEMA Regional Director or transmitted through him/her by another Federal agency. The Governor of the affected State will be consulted, if practicable.

III. The Declaration and Initial Operations

When the President declares a major disaster or an emergency, immediate notification is made to the Governor, appropriate Members of Congress, and Federal departments or agencies. At that time, the Director, FEMA, appoints an appropriate FEMA (or other Federal) official as the Federal Coordinating Officer (FCO). Concurrently with the President's action, the Associate Director, SLPS, based on the Governor's request, designates the kinds of assistance to be made available and the counties or other political subdivisions that are eligible to receive such assistance.

The immediate concern of the FCO after a declaration is to make an initial appraisal of the types of relief most urgently needed. The appraisal is based on data developed by the preliminary damage assessment as well as other information. The FCO then coordinates all Federal disaster assistance programs to ensure their maximum effectiveness and takes appropriate action to help affected citizens and public officials obtain the assistance to which they are entitled. Emergency support teams, composed of disaster assistance specialists from Federal agencies, assist the FCO in carrying out his or her responsibilities.

The responsibilities of the FCO also include the coordination, with their consent, of the efforts of private relief organizations such as the American Red Cross, the Salvation Army, and the Mennonite Disaster Service.

The FCO establishes a temporary Disaster Field Office (DFO) within the affected area to coordinate the disaster relief and recovery effort. This office is staffed with representatives of Federal agencies having disaster assistance responsibilities and is usually collocated with the Office of the State Coordinating Officer (SCO), who is appointed by the Governor and serves as the primary point of contact with the FCO and between State and local officials.

After the President's declaration of a major disaster or an emergency, the Governor and the appropriate FEMA Regional Director execute a FEMA-State Agreement which prescribes the manner in which Federal aid under the Stafford Act is to be made available. The agreement lists the areas within the State which are eligible for assistance; stipulates any division of costs among Federal, State, and local governments; specifies the period officially recognized as the duration of the major disaster or emergency; and contains other conditions of assistance.

If other kinds of assistance are approved on the basis of further information, or additional jurisdictions are designated eligible for assistance, the agreement is amended accordingly.

IV. Assistance to Individuals

One of the most important objectives after any disaster is to inform individuals of the assistance available and to assist them in the application and delivery process. Information out-lining available aid programs is disseminated by FEMA through radio, television, newspapers, and the mass distribution of pamphlets, as well as through outreach teams and toll-free telephone hotlines.

To make it easier for individuals to get information and obtain the help available from various Federal, State, local, and volunteer agencies, FEMA may establish one or more Disaster Application Centers (DACs) in the disaster area. Representatives of Federal departments and agencies, State and local governments, private relief agencies, and other organizations which can provide assistance or counseling are available to register and advise disaster victims. These centers are kept in operation as long as required. In addition, mobile teams may be sent to assist persons in areas without easy access to a DAC.

A Presidential declaration of a major disaster can make a broad range of assistance available to individual victims. This "Individual Assistance" may include:

- Temporary housing, until alternative housing is available, for Disaster victims whose homes are uninhabitable. Home repair funds may be given to owner-occupants in lieu of other forms of temporary housing assistance, so that families can quickly return to their damaged homes;
- Disaster unemployment assistance and job placement assistance for those unemployed as a result of a major disaster;
- Individual and family grants of up to \$10,400 (this amount is adjusted for inflation annually) to help meet disaster-related necessary expenses or serious needs when those affected are unable to meet such expenses or needs through other programs or other means;
- Legal services to low-income families and individuals;
- Crisis counseling and referrals to appropriate mental health agencies to relieve disaster-caused mental health problems;

- Loans to individuals, businesses, and farmers for repair, rehabilitation, or replacement of damaged real and personal property and some production losses not fully covered by insurance;
- Agricultural assistance, including technical assistance; payments covering a major portion of the cost to eligible farmers who perform emergency conservation actions on farmland damaged by the disaster; and provision of federally owned feed grain for livestock and herd preservation;
- Veterans' assistance, such as death benefits, pensions, insurance settlements, and adjustments to home mortgages held by the Department of Veterans Affairs (VA) if a VA-insured home has been damaged;
- Tax relief, including help from the Internal Revenue Service in claiming casualty losses resulting from the disaster, and State tax assistance;
- Waiver of penalties for early withdrawal of funds from certain time deposits; and
- The Cora Brown Fund, to assist victims of natural disasters for those disaster-related needs that have not been or will not be met by government agencies or private organizations that have programs to address such needs.

V. Assistance to State and Local Governments

As soon as practicable following the President's declaration of a major disaster or an emergency involving assistance to State and local governments and eligible private nonprofit (PNP) organizations, the State, assisted by FEMA, conducts briefings for State, local, and PNP officials to inform them of the types of assistance available under the declaration and the means by which funds are provided for eligible disaster assistance projects. The applicant must submit a Notice of Interest within 30 days after the area is designated eligible for assistance.

Eligible applicants for assistance are States, political subdivisions of States, Indian tribes or authorized tribal organizations, Alaska native villages or organizations, and qualifying private nonprofit institutions within the designated disaster area. Eligible private nonprofit institutions are educational, utility, emergency, medical, custodial care, and those providing essential services of a governmental nature.

Following the briefings, a Federal/State/local team inspects every damaged site. Federal engineers prepare Damage Survey Reports (DSR) to provide a recommended scope of work and estimated costs in accordance with FEMA eligibility criteria. The criteria allow repairs or restoration of facilities to their predisaster condition in accordance with applicable codes, specifications, and standards. For insurable facilities within the identified base floodplain, the amount of flood insurance recovery which would have been payable had the facility been insured to the maximum under a standard flood insurance policy will be subtracted from otherwise eligible costs. A Single Project Application is submitted by the State to the FEMA Regional Director for approval. The State serves as the grantee for the program with overall program management and financial responsibilities.

Under a major disaster declaration, assistance may be approved to fund a variety of projects, including:

- Clearance of debris, when in the public interest, on public or private lands or waters;
- Emergency protective measures for the preservation of life and property;

- Repair or replacement of roads, streets and bridges;
- Repair or replacement of water control facilities (dikes, levees, irrigation works, and drainage facilities);
- Repair or replacement of public buildings and related equipment;
- Repair or replacement of public utilities; and
- Repair or restoration of recreational facilities and parks.

Under an emergency declaration, assistance may be approved for public health and safety, emergency measures necessary to save lives, clearance of debris, protection of property, and to lessen or avert the threat of a catastrophe.

An eligible recipient may receive a small project grant for each project where the Federal estimate of costs for an individual project is less than \$36,500 (this figure is adjusted for inflation annually). In such cases, payment of the Federal share will be made by the State immediately following approval. The Federal share is established for each declared event, but will not be less than 75 percent of the approved estimate of eligible costs. For projects approved over \$36,500, Federal funding will equal the Federal share of the actual eligible costs documented by a grantee and payment will be in the form of advances or reimbursement. Recipients may also elect one of the following funding options:

- Improved projects - The Governor's Authorized Representative may grant approval if a recipient desires to make improvements, but still restore the predisaster function of a damaged facility. Federal funding for such improved projects will be limited to the Federal share of the approved estimate of eligible cost.
- Alternative projects - The recipient may elect not to restore a damaged facility and instead use the funds from that facility to repair or expand other selected public facilities, to construct new facilities, or to fund hazard mitigation measures as alternate projects. Federal funding for alternate projects will be 90 percent of the Federal share of the approved estimate of eligible costs. FEMA must approve all alternate projects before work is started.

The applicant must comply with appropriate hazard mitigation, environmental protection and floodplain management regulations as a condition for receiving Federal disaster assistance.

Other forms of assistance that may be made available under a Presidential declaration of a major disaster include:

- Community disaster loans from FEMA to communities that may suffer a substantial loss of tax and other revenues and can demonstrate a need for financial assistance in order to perform their governmental functions;
- Repairs and operating assistance to public elementary and secondary schools by the Department of Education;
- Use of Federal equipment, supplies, facilities, personnel, and other resources (other than the extension of credit) from various Federal agencies;
- Repairs to Federal-aid system roads when authorized by the Department of Transportation; and
- Repairs to projects when authorized by the United States Army Corps of Engineers or the Soil Conservation Services.

VI. Hazard Mitigation Programs and Activities

In addition to the assistance provided to individuals and to State and local governments, FEMA also provides technical assistance and grants for hazard mitigation projects and activities. Hazard mitigation involves the identification and implementation of measures to reduce the severity of future disasters. The hazard mitigation assistance includes:

- Technical assistance and guidance in preparing or updating the required State Hazard Mitigation Plan;
- Technical assistance from Interagency Hazard Mitigation Teams or Hazard Mitigation Survey Teams, which survey the area following a disaster declaration to identify mitigation measures that may reduce future damages; and
- Funding of mitigation projects through the Hazard Mitigation Grant Program (HMGP), which can fund up to 50 percent of the cost of the project.

The HMGP provides funding for mitigation measures which substantially reduce the risk of future damages. The measures funded must be cost-effective and environmentally compatible, and should be identified through the evaluation of hazards in the preparation of the State Hazard Mitigation Plan. Total Federal funds available for the HMGP are limited to 10 percent of the Federal share of permanent restorative work completed in the Public Assistance Program. The State serves as the grantee for the program with overall financial and program management responsibilities. Eligible applicants for the grants include State agencies, local units of government, and eligible private nonprofit organizations.

VII. Assistance Without a Presidential Declaration

In many instances, disaster assistance may be obtained from the Federal Government and voluntary agencies without a Presidential declaration of a major disaster or an emergency. Federal establishments, particularly military installations which are located in or near the disaster area, may provide immediate lifesaving assistance, and other Federal agencies may be able to provide assistance under their own statutory authorities. The following assistance is available from various Federal and voluntary agencies. (Additional details are available from the offices listed in appendixes A and B.)

Search and Rescue

The United States Coast Guard or United States Armed Forces units may assist in search and rescue operations, evacuate disaster victims, and transport supplies and equipment.

Flood Protection

The United States Army Corps of Engineers has the authority to assist in flood-fighting and rescue operations and to protect, repair, and restore certain flood-control works that are threatened, damaged, or destroyed by a flood. They also have authority to assist States for a 10-day period subject to specific criteria.

Fire Suppression Assistance

The Stafford Act authorizes the President to provide assistance, including grants, equipment, supplies, and personnel, to a State for the suppression of a forest or grassland fire on public or private lands that threatens to become a major disaster. This authority has been delegated to the Associate Director, SLPS. The Governor of a State, or the Governor's Authorized Representative, must request such assistance through the Regional Director and should support the request with detailed information on the nature of the threat and the Federal assistance needed.

Health and Welfare

The Department of Health and Human Services may provide assistance to State and local welfare agencies and to State vocational rehabilitation agencies. The Public Health Service can aid States and local communities in emergency health and sanitation measures. The Food and Drug Administration may work with State and local governments in establishing public health controls through the decontamination or condemnation of contaminated food and drugs.

Emergency Conservation Program

The State Director may designate areas eligible for the Emergency Conservation Program of the Agricultural Stabilization and Conservation Service, United States Department of Agriculture. This program provides for cost-sharing grants to rehabilitate farm lands damaged by natural disasters.

Emergency Loans for Agriculture

The Farmers Home Administration (FmHA), may make emergency loans to farmers, ranchers, and aquaculturists in areas designated as eligible by the Secretary of Agriculture or the Administrator of FmHA.

Disaster Loans for Homeowners and Business

The Small Business Administration (SBA) can provide both direct and bank-participation disaster loans to qualified homeowners and businesses to repair or replace damaged or destroyed private property when the Administrator declares a disaster loan area under SBA's statutory authority. Economic injury loans can help small firms suffering economic losses as a result of a disaster.

Repairs to Federal Aid System Roads

The Federal Highway Administration of the Department of Transportation, can provide assistance to restore roads and bridges on the Federal Aid System.

Tax Refunds

The Internal Revenue Service can assist individuals in applying for casualty losses resulting from natural disasters.

Voluntary Agency Assistance

An essential element of almost any disaster relief effort is the assistance provided by private relief organizations in the distribution of food, medicine, and supplies; the provision of emergency shelter; and the restoration of community services. The American Red Cross, which operates under a Federal Charter (as provided by Public Law 58-4, approved January 5, 1905, 33 Stat. 599), provides grants and other types of assistance to individuals and families affected by disasters to meet their emergency needs. The Salvation Army, the Mennonite Disaster Service, other charitable organizations, and church groups provide significant assistance to those in need of help.

Department of Defense Predeclaration Emergency Assistance

The Stafford Act authorizes the President to utilize personnel and equipment of the Department of Defense to remove debris or provide temporary restoration of essential public facilities and services in the aftermath of an incident which may ultimately qualify for a major disaster or emergency. This authority has been delegated to the Associate Director, SLPS. The Governor of a State must request such assistance through the FEMA Regional Director and should support the request with a finding that such work is essential for the preservation of life and property. When authorized, the work may only be carried out for a period not to exceed 10 days.

Appendix A

Location of FEMA Offices

1. National Office
State and Local Programs and Support Directorate
Office of Disaster Assistance Programs
Washington, D.C. 20472
Telephone: (202) 646-3615
2. The location of each FEMA Regional Office and the States it serves are listed below:

Regional Office

FEMA - Region I (Boston)
J.W. McCormack Post Office
& Courthouse Bldg., Rm. 442
Boston, MA 02109
Telephone: (617) 223-9540

FEMA - Region II (New York)
26 Federal Plaza, Rm. 1338
New York, NY 10278
Telephone: (212) 238-8309

FEMA - Region III (Philadelphia)
Liberty Square Bldg., 2nd Floor
105 S. Seventh Street
Philadelphia, PA 19106
Telephone: (215) 931-5500

FEMA - Region IV (Atlanta)
1371 Peachtree Street, NE., Suite 700
Atlanta, GA 30309
Telephone: (404) 853-4200

States

Connecticut
Maine
Massachusetts
Rhode Island
Vermont

New Jersey
New York
Puerto Rico
Virgin Islands

Delaware
District of Columbia
Maryland
Pennsylvania
Virginia
West Virginia

Alabama
Florida
Georgia
Kentucky
Mississippi
North Carolina
South Carolina
Tennessee

Regional Office

FEMA - Region V (Chicago)
 175 W. Jackson Boulevard, 4th Floor
 Chicago, IL 60604-2698
 Telephone: (312) 408-5500

FEMA - Region VI (Denton)
 Federal Regional Center, Rm. 206
 800 N. Loop 288
 Denton, TX 76201-3698
 Telephone: (817) 898-9399

FEMA - Region VII
 911 Walnut Street, Rm. 200
 Kansas City, MO 64106
 Telephone: (816) 283-7061

FEMA - Region VIII (Denver)
 Denver Federal Center, Building 710
 Box 25267
 Denver, CO 80225-0267
 Telephone: (303) 235-4811

FEMA - Region IX (San Francisco)
 Disaster Assistance Programs
 Building 105
 Presidio of San Francisco, CA 94129
 Telephone: (415) 923-7100

FEMA - Region X (Bothell)
 Federal Regional Center
 130 228th Street, SW.
 Bothell, WA 98021-9796
 Telephone: (206) 487-8800

States

Illinois
 Indiana
 Michigan
 Minnesota
 Ohio
 Wisconsin

Arkansas
 Louisiana
 New Mexico
 Oklahoma
 Texas

Iowa
 Kansas
 Missouri
 Nebraska

Colorado
 Montana
 North Dakota
 South Dakota
 Utah
 Wyoming

American Samoa
 Arizona
 California
 Guam
 Hawaii
 Nevada
 Trust Territory of
 the Pacific Islands
 Commonwealth of the
 Northern Mariana
 Islands
 Federated States of
 Micronesia

Alaska
 Idaho
 Oregon
 Washington

Federal Emergency Management Agency Regional Boundaries



Appendix B

Location of State Offices Responsible for Disaster Operations

Director, **Alabama** Emergency
Management Agency
520 South Court Street
Montgomery, Alabama 36130
Telephone: (205) 834-1375

Director, **Alaska** Division of
Emergency Services
Department of Military
Veterans Affairs
3501 E. Bogard Road
Wasilla, Alaska 99687-2689
Telephone: (907) 376-2337

Disaster Program Coordinator
Department of Public Safety
American Samoa Government
Fagatogo, American Samoa
96799
Telephone: 011-684-633-2331

Director, **Arizona** Division of
Emergency Services
National Guard Building
5636 East McDowell Road
Phoenix, Arizona 85008
Telephone: (602) 244-0504

Director, Office of
Emergency Services
P.O. Box 758
Conway, **Arkansas** 72032
Tel. (501) 329-56501/Ext. 201
(501) 374-1201 (Little Rock)

Director, **California** Office of
Emergency Services
P.O. Box 9577
Sacramento, California 95823
Telephone: (916) 427-1624

Director, Disaster Emergency
Services
EOC, Camp George West
Golden, **Colorado** 80401
Telephone: (303) 273-1624

State Director, Office of
Emergency Management
360 Broad Street
Hartford, **Connecticut** 06105
Telephone: (203) 566-3180/4338

Director, Division of Emergency
Planning and Operations
P.O. Box 527
Delaware City, **Delaware** 19706
Telephone: (302) 834-4531

Director, Office of Emergency
Preparedness
District of Columbia Government
2000 14th Street, NW, 8th Floor
Washington, D.C. 20009
Telephone: (202) 727-6161

Director, Division of Emergency
Management
2740 Crestview Drive
Tallahassee, **Florida** 32399
Telephone: (904) 487-4918

Executive Director, **Georgia**
Emergency Management Agency
P.O. Box 18055
Atlanta, Georgia 30316-0055
Telephone: (404) 624-7000

Director, Civil Defense
Territory of Guam Emergency
Services
P.O. Box 2877
Agana, **Guam** 96910
Telephone: 011-671-477-9841

Vice Director of Civil Defense
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816
Telephone: (808) 734-2161

Coordinator, Bureau of
Disaster Services
Military Division
650 West State Street
Boise, **Idaho** 96816
Telephone: (808) 734-2161

Director, Illinois Emergency
Services and Disaster Agency
110 East Adams Street
Springfield, **Illinois** 62706
Telephone: (217) 782-6818

Director, Indiana Department of
Civil Defense and Emergency
Management
State Office Building, B-90
100 North Senate Avenue
Indianapolis, **Indiana** 46204
Telephone: (317) 232-3830

Administrator, Office of
Disaster Services
Hoover State Office Building,
Level A, Room 29
Des Moines, **Iowa** 50319
Telephone: (515) 272-5211

Deputy Director, Division of
Emergency Preparedness
P.O. Box C-300
Topeka, **Kansas** 66601
Tel. (913) 233-9253/Ext. 301

Executive Director, Kentucky
Disaster and Emergency Services
Boone Center, Parkside Drive
Frankfort, **Kentucky** 40601
Telephone: (502) 564-8680

Assistant Secretary, Office
of Emergency Preparedness
Department of Public Safety
P.O. Box 66536, Audubon Station
Baton Rouge, **Louisiana** 70896
Telephone: (504) 342-5470

Director, Maine Emergency
Management Agency
State Office Bldg., Station 72
Augusta, **Maine** 04333
Telephone: (207) 289-4080

Disaster Control Officer
Republic of the Marshall Islands
Majuro, **Marshall Islands** 96960
Telephone: 93-011-692-0-3234

Director, Maryland Emergency
Management and Civil Defense
Agency
Two Sudbrook Lane, East
Pikesville, **Maryland** 21208
Telephone: (301) 486-4422

Director, Massachusetts Civil
Defense Agency and Office of
Emergency Preparedness
P.O. Box 1496
400 Worcester Road
Framingham, **Massachusetts**
01701
Telephone: (508) 820-2000

Deputy State Director, Emergency
Management Division
Michigan State Police Department
300 S. Washington Sq., Suite 300
Lansing, **Michigan** 48913
Telephone: (517) 334-7950

Director, Disaster Control Office
The Federated States of
Micronesia 96941
Telephone: (011) 691-9228

Director, Division of Emergency
Management Agency
Department of Public Safety
State Capitol, B-5
St. Paul, **Minnesota** 55155
Telephone: (612) 296-2233

Director, Mississippi Emergency
Management Agency
P.O. Box 4501, Fondren Station
Jackson, **Mississippi** 39216
Telephone: (601) 352-9100

Director, State Emergency
Management Agency
P.O. Box 116
Jefferson City, **Missouri** 65102
Telephone: (314) 751-9571

Administrator, Disaster and
Emergency Services Division
Department of Military Affairs
P.O. Box 4789
Helena, **Montana** 59604
Telephone: (406) 444-6911

Assistant Director, Nebraska
Civil Defense Agency
National Guard Center
1300 Military Road
Lincoln, **Nebraska** 68508
Telephone: (402) 473-1410

Director, Nevada Division
of Emergency Services
Military Department
2525 South Carson Street
Capitol Complex
Carson City, **Nevada** 89710
Telephone: (702) 885-4240

Director, Governor's Office
of Emergency Management
State Office Park South
107 Pleasant Street
Concord, **New Hampshire** 03301
Telephone: (603) 271-2231

Deputy State Director, Office
of Emergency Management
New Jersey State Police Dept.
P.O. Box 7068
West Trenton, **New Jersey** 08628
Telephone: (609) 882-2000

Director, Technical and
Emergency Support Division
Department of Public Safety
4491 Cerrillos Road
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Terrorists and the Potential Use of Biological Weapons

A Discussion of Possibilities

Jeffrey D. Simon

RAND

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Terrorists and the Potential Use of Biological Weapons

A Discussion of Possibilities

Jeffrey D. Simon

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PREFACE

The research reported here was sponsored by the United States Armed Forces Medical Intelligence Center (AFMIC) under a project entitled "Terrorist Use of Unconventional Weapons." It is part of a series of studies undertaken to provide a better understanding of the potential use of biological weapons by terrorists. This report does not attempt to predict where or when a terrorist attack with biological agents might take place, nor does it purport to describe all the types of biological agents that could be used by terrorists. Rather, its intent is to explore the reasons why terrorists have not yet used biological weapons, and what might lead to the use of such weapons by terrorists in the future.

SUMMARY

Terrorists can cause death and destruction through a variety of means. They can mount traditional attacks, such as hijackings, kidnappings, shootings, and bombings. Alternatively, they can turn to unconventional attacks using biological, chemical, or nuclear weapons. This report addresses one aspect of the unconventional threat: the potential for terrorists to use biological weapons.¹

The report first discusses the implications of recent trends in terrorism for the future use of biological agents and the reasons why terrorists might be motivated to use them. It then identifies several constraints that inhibit terrorists from venturing into this new type of conflict and the factors that could break down these constraints. The report then establishes some broad characteristics that could identify the types of terrorist groups that might be more likely than others to use biological weapons.

Recent trends in terrorism have shown an increase in the number of incidents with fatalities and in the number of people killed in terrorist attacks. The 1980s witnessed the growth of religiously inspired terrorism, where acts of violence are expected to be rewarded in the afterlife. There has also been a rise in state-sponsored terrorism, which may make it easier for terrorists to acquire biological weapons.

Biological weapons would provide terrorists with new ways to threaten or inflict violence on potential victims. They would produce far more casualties than traditional types of terrorist attacks. Terrorists may also view biological weapons as a way to undermine the economy of a country or inflict heavy casualties upon its military forces, objectives that are precluded by most types of traditional attacks.

Terrorists, nevertheless, have rarely ventured into the area of biological warfare. Although there have been a number of threats, neither interviews with terrorists nor terrorists' writings have made specific references to the use of biological weapons.

This can be attributed to several factors. First, despite popular perceptions of terrorists as "irrational," many terrorist groups have specific constituencies to whom they try to appeal. The use of biological agents could alienate these supporters, as the casualties from an

¹Although this study focuses on biological agents, much of its argument could also be applied to chemical weapons. The use of chemical or biological agents would involve significant departures from traditional types of terrorism, and either would therefore require a decision by a terrorist organization to escalate to a higher level of violence.

attack with such agents would far exceed those from other types of terrorist incidents. In addition, a government attacked by terrorists with biological weapons could very well respond with a crackdown that would destroy the group. There is also a reluctance among terrorist groups to experiment with unfamiliar weapons. Finally, the supporters of a terrorist organization—and the terrorists themselves—might be among the casualties of a biological-weapons attack.

However, the constraints against the use of biological weapons may be weakening. In recent years, terrorists have found it necessary to launch more dramatic and more violent attacks to attain the kind of publicity that was once generated by less spectacular incidents. Car bombings, airplane sabotage, and kidnappings have now become routine, and the desire to obtain immediate attention could be a prime motivation for a terrorist group to turn to biological agents. The reluctance of terrorists to experiment with unfamiliar weapons may also be weakening, as state-sponsored terrorism becomes a dominant form of international violence. A state sponsor would have little trouble training a terrorist group in the proper use of biological agents and would be able to supply a wide variety of such weapons.

Independent terrorist groups may also find the uncertainty factor eroding, as more information about biological agents becomes available. Several agents exist that can be used without sophisticated technical knowledge. Furthermore, it would not be difficult to recruit people with enough scientific background to produce the desired agents.

Existing constraints against the use of biological weapons would be most severely weakened, however, by an attempt by some terrorist group to use them in a highly publicized incident. Terrorists tend to copy the actions of others, and an incident involving biological weapons would not even have to be successful to open up a floodgate of further assaults. Since terrorism is a highly symbolic type of conflict, "failed" attacks—e.g., bombs that do not explode or missiles that miss their target—can be almost as effective, in terms of publicity and public fear, as successful ones. Furthermore, terrorist groups can learn from the mistakes of others and use new weapons more effectively in the future.

It is difficult—if not impossible—to predict which specific groups might use biological weapons or what their targets might be. Nevertheless, potential biological-weapon users would be likely to exhibit certain characteristics. First, they would be likely to have a general, undefined constituency that presents few restraints concerning the moral implications or the potential public backlash associated with a biological-agent attack. Second, they would be likely to have a previous pattern of large-scale, high-casualty-inflicting incidents. Third,

they would have demonstrated a certain degree of sophistication in weaponry or tactics. And finally, they would probably have shown a tendency to take risks in their attacks.

Since the technological, logistical, and financial barriers to the use of biological agents are not insurmountable, a key determinant in the potential use of such agents will be the willingness of terrorists to engage in this new type of violence. Therefore, efforts to improve intelligence regarding terrorist group strategies and capabilities will become increasingly critical in the future.

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I. INTRODUCTION

The widespread fear of terrorism stems from several sources. On the individual level, everyone sees himself as a potential victim. Whenever a hijacking or bombing is reported in the media, people wonder whether they might be the next target. In the aftermath of a series of major international terrorist events in 1985 and 1986—including the hijacking of TWA Flight 847, the seizure of the *Achille Lauro* cruise liner, the massacres at the Rome and Vienna airports, and the midair bombings of Air India and TWA jets—Americans became fearful of traveling abroad. This fear intensified following the U.S. air raid on Libya and was renewed with the 1988 bombing of Pan Am Flight 103 over Lockerbie, Scotland.

Yet on both the individual and national levels, terrorism, for the most part, poses a less serious threat to the United States than is commonly believed. In 1985 and 1986—two years during which the terrorist threat was perceived to be at its highest level for the decade—American fatalities accounted for only 3 percent of the worldwide totals. Moreover, the number of U.S. fatalities due to indigenous terrorism is miniscule.

The threat that most forms of terrorism pose to U.S. national security and global interests is also minimal. Even the hijacking of an airliner with Americans aboard, which generates a great deal of emotion and extensive media coverage, has limited consequences for the country's security.¹

However, a single incident involving the use of biological weapons by terrorists could have catastrophic results. With a very small amount of certain biological agents and an effective means for dispersing them, terrorists could conceivably kill tens of thousands of people and create an unprecedented crisis for the United States.

Many accounts have been written of the possible consequences of terrorists unleashing biological agents on the world's population.² To understand the threat of terrorists with biological weapons, however, it is necessary to examine the diversity in terrorist groups and tactics

¹For a discussion of the terrorist threat to U.S. interests and a critique of U.S. policy responses, see Jeffrey D. Simon, "Misunderstanding Terrorism," *Foreign Policy*, Summer 1987, pp. 104–120.

²See Joseph D. Douglass, Jr., and Neil C. Livingstone, *America the Vulnerable: The Threat of Chemical and Biological Warfare*, Lexington, Mass., D.C. Heath and Co., 1987; Richard Charles Clark, *Technological Terrorism*, Old Greenwich, Conn., The Devin-Adair Company, 1980.

that might make some groups more likely than others to utilize biological agents. It is also necessary to identify the constraints that probably inhibit terrorists from using such weapons, and the conditions under which those constraints might be removed.

Because there is no substantive track record of biological-weapons attacks by terrorists—beyond a number of threats and a few “low-level” incidents—any assessment of the threat is necessarily speculative. Moreover, neither interviews with terrorists nor terrorists’ own writings have made specific reference to the use of biological weapons.³

This report focuses primarily on the terrorist threat regarding biological agents, but much of the argument presented could also be applied to the potential terrorist use of chemical weapons. The use of either type of agent would represent a significant departure from traditional types of terrorism and would require a decision by a terrorist organization to escalate to a higher level of violence.

There are, however, some important differences between chemical and biological agents in terms of potential terrorist use. There have been more incidents—albeit at a relatively low level of violence—in which terrorists and criminals have used chemical agents (e.g., the Tylenol poisoning and various product contamination cases) than incidents involving biological weapons. Also, biological agents are microorganisms and are therefore likely to be less controllable than chemical weapons.

Nevertheless, the use of biological agents is not as difficult as is commonly assumed. The term biological “weapons”—as used in this report—tends to conjure up images of elaborate systems such as bombs, missiles, etc. In reality, however, a biological “weapon” can be something as unexpectedly simple as the use of a low-flying airplane or even a spray can to disperse anthrax spores, or the use of an umbrella with a ricin-poisoned tip. These are slightly more complicated operations than using a gun or setting off a bomb, but they can yield disproportionately dramatic results in terms of capturing world attention or inflicting heavy casualties upon terrorists’ targets.⁴

The exact form of a future biological terrorist incident cannot be determined. The type of attack will depend on the motivations and

³However, Abu Tayyib, the commander of Fatah’s Force 17, stated in an interview that the Palestine Liberation Organization (PLO) has chemical weapons and would not hesitate to use them in future wars. (See Foreign Broadcast Information Service (FBIS), January 13, 1988, p. 47.)

⁴The use of biological agents can also carry significant political and personal risks for terrorists. These are discussed below.

capabilities of the specific terrorist group and the vulnerability of the targets.⁵

Also, while the thought of terrorists using more lethal weapons usually evokes images of nuclear terrorism, there is less likelihood of a nuclear terrorist attack than there is of a biological attack. The tight security around nuclear facilities, the problems of transporting a nuclear weapon, and the lack of technical knowledge needed to detonate or fire such a device all make the use of nuclear weapons very difficult for terrorists.⁶ While sabotaging nuclear power plants may be easier than stealing a nuclear bomb or nuclear materials, terrorists are likely to be deterred from either type of attack by the security around nuclear plants.

Biological agents may also present a more attractive option for terrorists intent on using "new" kinds of weapons. The laboratories from which such agents could be stolen do not have the same level of security as nuclear plants or nuclear weapons depots. Furthermore, attempts have already been made to obtain the ingredients for developing biological agents through the mail. In 1984, two Canadians were arrested in Buffalo for placing orders with a U.S. research firm for cultures of botulism and tetanus. The Canadians claimed to be representing a research company which turned out to be nonexistent.

Biological agents are also more readily available and cheaper to purchase and develop into weapons than nuclear materials. In addition, less technical knowledge is required to use certain types of biological agents than is required for nuclear devices. Biological agents include viruses, bacteria, fungi, protozoa, and rickettsiae. Toxins, i.e., chemicals that can be extracted and purified from biological entities, can be considered as between chemical and biological agents.⁷

⁵An experiment by the Army in the late 1960s revealed the vulnerability of New York City's subway system to an attack with biological agents. Aerosol clouds of a harmless bacteria were sprayed through sidewalk vents into subway stations in Manhattan. The bacteria were then spread by the wind of the speeding trains throughout many stations. In addition, light bulbs containing the bacillus were tossed from the trains into subway tunnels. The vulnerability of various targets to a biological-agent attack was also illustrated by placing colored dye into the water system of a government building in Washington, D.C. (See *New York Times*, September 19, 1975; *International Herald Tribune*, April 23, 1980.)

⁶The increasing role that state sponsors are playing in international terrorism, however, has made the nuclear terrorist threat less remote than it was a decade ago. (See Bruce Hoffman et al., *A Reassessment of Potential Adversaries to U.S. Nuclear Programs*, The RAND Corporation, R-3363-DOE, March 1986.)

⁷Douglass and Livingstone, *America the Vulnerable*, p. 13; Brian Beckett, *Weapons of Tomorrow*, London, Orbis Publishing, 1982, p. 108.

Biological material can be obtained from academic, biological, biotechnological, or commercial sources. According to the World Health Organization, aerosol transmission of yellow fever has already been achieved in a laboratory setting, and aerosol infection of Rocky Mountain spotted fever has also been proven possible. Aerosol dispersion of heavy concentrations of anthrax spores is also feasible.⁸

Clearly, then, the potential exists for terrorists to use a whole new class of weapons. This report does not attempt to predict where or when a terrorist attack with biological agents might take place, nor does it purport to describe all the types of biological agents that could be used by terrorists. Rather, it explores the reasons why terrorists have not yet used biological weapons, and the motivations that could lead to the introduction of such weapons as a form of terrorism in the future.

The following key questions are addressed below:

- What are the implications of current trends in terrorism for the potential terrorist use of biological weapons?
- What current constraints inhibit the use of biological weapons by terrorists, and what factors would tend to remove these constraints?
- Which types of terrorist groups may be more likely than others to use biological weapons?

⁸*Health Aspects of Chemical and Biological Weapons*, World Health Organization, Geneva, 1970, pp. 60-83. It should be noted that toxicity alone is not a sufficient measure of the ability of a substance to affect large numbers of people. Means for dispersing the substance to maximize exposure are also required. I would like to thank Jerry Aroesty for raising this point.

II. IMPLICATIONS OF RECENT TRENDS IN TERRORISM

TRENDS IN TERRORIST ACTIVITY

Several trends point to the potential introduction of biological weapons by terrorists in the future:

- A recent increase in high-casualty events.
- The incidence of more spectacular terrorist events.
- Increasing blackmail/extortion terrorist threats.
- The growth of state-sponsored terrorism.
- An increase in religiously inspired terrorism.

The nature of terrorism has changed dramatically in the past few decades. Bombings of airliners, suicide car- and truck-bombing attacks, and massacres of civilians have all become commonplace in the 1980s. More terrorist groups are active today than ever before, and more terrorist incidents are being perpetrated. In 1968, 134 international terrorist incidents were recorded; by 1986, the number had risen to 412. Figures for 1988 indicate a total close to 400.¹

There has also been an increase in the number of incidents with fatalities. During the 1970s, an average of 44 terrorist incidents per year resulted in at least one death. Between 1980 and 1987, this average increased to 77 incidents per year. The number of people killed in terrorist attacks has also increased. There have been wide fluctuations, however, because in some years, a single incident has caused hundreds of deaths. For example, in 1985, 854 people were killed in international terrorist incidents, compared with 223 in 1984 and 329 in 1986. A large percentage of the 1985 death toll was due to the midair bombing of an Air India jet, which claimed 363 lives. Similarly, three incidents in Lebanon in 1983—the bombings of the U.S. Marine barracks, the U.S. Embassy, and the French paratroopers headquarters—accounted for more than half (350) of that year's international terrorism fatalities. And 270 of the 649 fatalities in 1988 resulted from a single incident, the bombing of Pan Am Flight 103.

¹These and other data in this report are based on the RAND Chronology of International Terrorism. The chronology includes only international incidents; indigenous terrorism, such as attacks by the Basque separatist group E.T.A. against Spanish targets in Spain are not recorded.

The growing lethality of international terrorism may indicate an increasing potential for the use of biological weapons by terrorists. Since attacks involving biological agents would be likely to result in extensive deaths and injuries, the increasing violence of terrorists in recent years is an ominous trend.

The tendency for a few spectacular incidents to capture world headlines and elicit dramatic government responses is another trend that has implications for the future use of biological weapons. The bombing of Pan Am Flight 103 illustrated how terrorists can use a single dramatic attack to heighten a sense of fear among the public in many countries. Since almost any type of biological incident would certainly be even more dramatic, it would fit into this recent pattern.

Terrorists have also threatened blackmail, with respect to both chemical and biological agents. Although most of the threats have turned out to be hoaxes, the consequences of a real incident are so great that each threat must be taken seriously—at least initially. Some groups or individuals may possess enough of an agent to effectively carry out the threat. In 1980, two casinos in Lake Tahoe were sent extortion notes demanding \$10 million to prevent their water supply from being poisoned. A sample of the poison, which was believed to be an herbicide containing an element of Agent Orange, accompanied the notes. But officials were able to discount the threat, since approximately 7,000 pounds of the poison would have been needed to contaminate the 1.5-million-gallon water tank of one of the casinos.

In another case, four people were arrested in 1987 in London after threatening to release a poison gas over Nicosia, the capital of Cyprus, if they were not paid \$15 million. The threat specified that dioxin would be released on the mountains south of Nicosia and then carried over the city by the wind. The blackmailers had planned to carry out several bomb attacks to force the Cypriot government to give in to their demands. There was no indication that the group actually possessed dioxin, and Scotland Yard stated that the terrorists did not appear to have the means to carry out the threat. However, the threat was taken seriously enough by Cypriot government officials to initiate studies on how to cope with the aftermath of a dioxin attack.²

The rise of state-sponsored and religiously inspired terrorism also needs to be considered in assessing the biological-weapons threat. Terrorists who have the financial, technical, and logistical support of foreign governments have many advantages over other terrorist groups—easier access to sophisticated weapons and false passports, assistance in penetrating tighter security, and protection after

²FBIS, June 9, 1987, pp. 56–61.

incidents. Terrorists contemplating a biological attack would find it easy to obtain virtually any type of biological agent, as well as instructions in how to use such agents, once they acquired government support.³

The religious dimension of terrorism also points to the possible use of biological weapons. If a terrorist believes that acts of violence are not only politically, but also morally justified, he has a powerful incentive for any type of terrorist attack. The belief that one is rewarded in the afterlife for violence perpetrated on earth encourages undertaking high-risk attacks. The suicide bombings in Lebanon by Shiite extremists loyal to the late Ayatollah Ruhollah Khomeini were only one manifestation of this type of thinking. The growth of Islamic fundamentalist terrorism may have raised existing thresholds of the death and destruction terrorists are willing to inflict on others.

Religious fundamentalist terrorism, however, is not indiscriminate violence, since specific targets are pursued. In Lebanon, these targets have included U.S. military and diplomatic personnel and rival political and religious factions. Since biological weapons are less controllable than conventional bombs, they would claim far more unintended victims. This may be a risk that even the religious extremists are unwilling to take. However, if the background violence in a country is extensive—as it is in Lebanon, where car-bombing wars, militia skirmishes, and other attacks are almost daily occurrences—more dramatic and deadly attacks may be deemed necessary to attain the desired attention and objectives. This, combined with the blind-faith attitude of some followers of religious fundamentalist leaders, could make a biological-weapons attack likely if a leadership determined that such an attack would be beneficial to its cause.

OBJECTIVES OF BIOLOGICAL WEAPONS FOR TERRORISTS

In addition to the higher numbers of casualties in recent incidents, the spectacular nature of several incidents, and the rise of state-

³There are many variations in state-sponsorship of terrorism. For example, a state can assist independent terrorist groups in certain actions when it believes those actions are in its interests. A state may also directly control a terrorist group that is acting primarily as its agent, or it may even use its own agents. Each of these types of state sponsorship carries different risks and benefits for the foreign government, particularly with respect to the use of biological agents. A government would not want to be found responsible for a terrorist act, particularly one with the potential backlash of biological weapons, and using one's own terrorist group or agents could leave a trail directly to the government. Use of independent groups might allow for more ways to cover up a state's involvement, but a group that is supplied with biological weapons could some day use those weapons against the supplying state itself or embark upon unauthorized operations.

sponsored and religiously inspired terrorism, there are other reasons to believe that terrorists may be inclined to use more lethal weapons in the future. The use of biological weapons could meet several terrorist objectives, including the following:

- To create fear in the general population.
- To protest a government's policies.
- To perpetrate an extortion.
- To undermine the economy of a target nation.
- To deliver a serious blow to a country's military forces.
- To allow for "quiet" terrorist assaults.

The creation of fear is a central characteristic of terrorism. The very term *terrorism* implies fear and terror. Terrorists can attack the general public, diplomats of a particular country, airline travelers, and many other kinds of groups and individuals. Terrorists often attempt to create a sense of fear in order to portray a government as either unable to prevent attacks on its citizens and representatives or losing control over events. This in turn can lead to a loss of public confidence. It can also lead to repressive measures by a beleaguered government—e.g., declarations of states of emergencies, detentions without trial—that might alienate the public.

A terrorist incident or threat involving biological agents would hold even greater promise for creating this cycle of fear. The release of deadly agents into the atmosphere would very likely cause a crisis for both the federal and local governments. In India, the disclosure by a terrorist suspect that other terrorists might poison drinking water tanks led to a statewide alert in 1986. In West Germany, published reports in 1979 that Palestinians in Lebanon were training the leftist Red Army Faction (RAF)—a group originally made up of remnants of the Baader-Meinhof gang—in the use of bacteriological weapons created concern in Bonn. A few years earlier, the Baader-Meinhof gang had threatened to poison water in 20 West German towns if three radical lawyers were not allowed to defend a comrade who was on trial. And in 1980, police raided an RAF apartment in Paris and found a miniature laboratory containing a culture medium of *Clostridium botulinum*, which produces the botulinal toxin. Police also found notes about bacteria-induced diseases in the apartment.⁴ In another case, Australian authorities received an anonymous threat in 1984 warning that foot-and-mouth bacteria would be released if reforms in Queensland Prisons were not implemented.

⁴*International Herald Tribune*, November 8–9, 1980; FBIS, December 19, 1980, p. 8.

In addition to being a means for protesting policies or attempting to create public fear, the use of biological or chemical agents might also be attractive to terrorists seeking an extortion or blackmail device. As pointed out above, governments can be the target of blackmail attempts made to attain funds, but most such threats—especially in the case of chemical agents—have been issued against private companies. In Japan, the “Man with 21 Faces” extortion group placed cyanide-laced candy on store shelves to obtain money from the Morinaga Candy Company. In the United States, several individuals attempted to capitalize on a series of incidents in which people died after taking Tylenol capsules laced with cyanide. Following the deaths and the discovery of several additional tainted bottles, extortionists throughout the country tried to blackmail companies with threats of product contamination. In a separate incident, a California man was arrested for threatening to set off a “toxic bomb” unless he received a \$1 million ransom payment. Other incidents included a 1978 threat to contaminate the water supply of Phoenix, Arizona, if extortion payments were not made.

Terrorists may also be drawn to biological or chemical agents as a means of achieving objectives that are precluded by the use of conventional weapons. For example, a bombing, hostage episode, or shooting will have virtually no effect on a nation's economy. However, the threat of poisoning key export products can create serious problems. This tactic has already been used effectively in several cases. Palestinian extremists injected Israeli oranges in 1978 with mercury, stating that their goal was not to “kill people in nations that import the oranges but [rather] to sabotage the Israeli economy.” Several children in the Netherlands became sick after eating the oranges. Poisoned Israeli oranges were also discovered in Great Britain and West Germany. One year later, the same Palestinian group, the Arab Revolutionary Army, threatened to poison Israeli agricultural exports to the European Economic Community. In 1986, Tamil guerrillas in Sri Lanka sent letters to the embassies of several Western nations claiming to have put potassium cyanide in Sri Lankan tea that was destined for export. And in 1988, minute traces of cyanide were found in two Chilean grapes, resulting in the quarantine and recall of all Chilean fruit in the United States for several weeks. The Chilean economy was seriously damaged by this incident.

Against military targets, biological terrorist attacks might yield more significant results than conventional or even chemical attacks. The potential for terrorists to incapacitate a military base or kill all personnel at a facility is likely to be greater with the use of biological weapons than with other types of attacks. Thus, terrorists might see

biological agents as a replacement for car bombings, rocket attacks, and assassinations in their operations against military targets.

Finally, biological agents may offer terrorists certain logistical advantages over conventional weapons. Biological weapon attacks can be more "quiet" than conventional attacks. Terrorists who want to facilitate their escape after an incident might find biological weapons well suited for that purpose. In 1978, Bulgarian defector Georgi Markov was assassinated by a Bulgarian agent on a London street. Rather than shoot the victim with a gun and draw attention, the Bulgarian agent used an umbrella weapon that fired microscopic pellets into Markov's leg. The pellets contained the deadly poison ricin, which inhibits the cells that synthesize protein and eventually causes death.⁵ Thus, while we tend to think about biological weapons as agents of mass destruction—which they certainly can be—there is also a more "practical" side to these weapons from the terrorists' perspective.

Biological weapons can thus provide terrorists with new ways of committing violent acts, ranging from extorting bigger payoffs from governments or companies to inflicting damage to a country's economic, political, and even military structure. If biological weapons would indeed serve many purposes for terrorists, why has this form of terrorism not become more prevalent? The answer lies in the constraints that have thus far inhibited terrorists from the large-scale use of biological weapons.

⁵Beckett, *Weapons of Tomorrow*, p. 107.

III. CONSTRAINTS AGAINST USING BIOLOGICAL WEAPONS

FACTORS INHIBITING TERRORIST USE OF BIOLOGICAL WEAPONS

The absence of large-scale terrorist incidents involving biological agents can be attributed to at least five factors:

- Terrorists may not want to create a backlash among their supporters.
- Terrorists may not want to unleash too strong a response from a government that is the target of a biological agent attack, since such a reaction could virtually eliminate the group.
- Terrorists may be fearful of the personal risks involved in using biological weapons.
- Most terrorists are reluctant to experiment with unfamiliar weapons.
- Terrorists may perceive conventional attacks as meeting their objectives.

Despite popular perceptions of terrorists as "irrational," the majority of terrorist groups have specific constituencies to whom they try to appeal. These constituencies include financial backers as well as larger segments of a population. The use of biological agents could create a backlash among these supporters as the numbers of casualties mount. The supporters of a terrorist organization may condone certain killings as necessary to further their cause, but it is quite another thing to justify killing thousands of people. That terrorist groups are well aware of the political costs of miscalculated attacks was evident in 1987 when both the Irish Republican Army (IRA) and E.T.A. issued public apologies for bombings that killed innocent civilians.

Terrorists may also fear that a government subjected to a biological attack will retaliate with a very strong response against the group itself. While eliciting a repressive response could serve the interests of a terrorist group, it is likely that the response of the targeted government, the public, and other governments will be unprecedented anger at the group responsible for the attack, and the result could be the virtual elimination of the group through arrests and other acts.

The use of biological agents also carries the risk that the terrorists' supporters—and the terrorists themselves—might be among the casu-

alties. Unlike conventional or even chemical attacks, which usually can be limited to the intended targets, biological weapons represent virtually unexplored terrain for terrorists. They cannot estimate the consequences of dispersing microorganisms into the atmosphere. It may thus be that reluctance to experiment with unfamiliar weapons is a major constraint inhibiting terrorists' use of biological agents.

Terrorists can also be deterred from embarking on attacks with biological agents if they perceive that conventional attacks are meeting their objectives. While terrorists have not succeeded in toppling governments or creating separate states, they are nevertheless well aware that a major hijacking, bombing, or kidnapping will generate worldwide publicity for their cause. Such incidents also put them on an equal footing with governments, forcing high-level officials to engage in a war of words with the terrorists. Thus, as long as terrorists believe that present-day tactics are sufficient to meet their objectives and they remain fearful of the political and personal risks associated with biological agents, there will be a reluctance to utilize these weapons.

WEAKENING OF THE CONSTRAINTS

However, there are a number of indications that the constraints against terrorists' use of biological weapons may be weakening. In recent years, terrorists have found it necessary to launch more dramatic and violent attacks to attain the same degree of publicity and government responses that smaller incidents previously generated. With terrorist attacks occurring on an almost daily basis, the public and the media have become somewhat desensitized.¹ And with a multitude of terrorist groups "competing" for the international spotlight, more dramatic incidents are likely in the future. It would be difficult to conceive of a terrorist incident more dramatic—or guaranteed to gain more attention—than one involving biological agents.

The reluctance of terrorists to experiment with unfamiliar weapons may also be weakening as state sponsorship of terrorism increases. A state sponsor would have little trouble training a terrorist group in the use of biological agents and would be able to supply a wide variety of such agents. Foreign governments could also give false assurances to terrorists about the safety of using biological agents to get them to carry out an unknowingly suicidal attack that would thus eliminate any connection to the state sponsor. This possibility is not without prece-

¹For a discussion of this point, see Brian M. Jenkins, *Future Trends in International Terrorism*, The RAND Corporation, P-7176, December 1985, p. 14.

dent: Many bombs have been unknowingly carried into airports and other facilities by people who were tricked by somebody else.

Independent terrorist groups may also find the uncertainty factor in biological weapons eroding as more information becomes available. Several biological agents can be produced either at home or in a small laboratory, without sophisticated scientific knowledge. And terrorist groups that decide to use biological agents would have little difficulty recruiting somebody with enough scientific expertise to produce certain agents.

Finally, the political risks associated with using biological weapons might be deemed worth taking—or even necessary—by a terrorist group under certain circumstances. Conventional terrorism has been characterized by increasingly extreme attacks in response to defeats and setbacks. In May 1987, the IRA suffered its worst defeat in 18 years of conflict in Northern Ireland when British security forces killed eight IRA members in a shoot-out near a police station. The IRA responded several months later with a bombing on Remembrance Day—an annual ceremony to honor those who lost their lives in both World Wars—that killed 11 people and injured 55 others. In 1983, the African National Congress (ANC) set off its most powerful car bomb attack in downtown Pretoria, killing 20 people and injuring 170. This followed a South African raid into Lesotho several months earlier in which 12 ANC members had been killed. Thus, groups that suffer major setbacks at the hands of a government may one day turn to unconventional weapons as a last resort to either regain momentum or avert total collapse of their movement.

But the event most likely to break down existing constraints against using biological agents would probably be the use of such weapons by some terrorist group in a highly publicized incident. Terrorists tend to copy the actions of other terrorists; for example, a rash of car bombings followed the first few that occurred in Lebanon, and the midair bombing of an Air India jet in 1985 was followed by several attempts to place bombs aboard other airliners. Several recent incidents—including the crash of the Pan Am airliner in 1988—have involved bomb explosions.

Even an unsuccessful terrorist attack with biological weapons could open up a floodgate of further assaults. Since terrorism is a highly symbolic type of conflict, “failed” attacks can be almost as effective as successful ones. The publicity that is generated, the fear that is instilled in the public, and the government responses that arise are often the same, regardless of the degree of “success” of a terrorist incident. And other terrorist groups might learn from the mistakes of

others, enabling them to use the weapons more effectively in the future.

Iraq's successful use of chemical weapons in its war against Iran and its subsequent chemical attacks against Kurdish insurgents may already have weakened the constraints against terrorist use of biological or chemical weapons. If a government demonstrates that such weapons can prove decisive on the battlefield, this provides a powerful incentive for terrorists. The disclosure that Libya is building a chemical weapons factory also indicates that it may become easier for terrorists to obtain more lethal types of weapons. Since Libya is a state sponsor of terrorism, its ability to manufacture such weapons could hasten the day when terrorists acquire and utilize them.

Thus, there are several reasons to believe that biological weapons will eventually be seriously considered—and probably used in some manner—by terrorists. With more than 100 terrorist groups active around the world and new ones arising every month, a key question becomes how to distinguish the groups that are most likely to attempt an attack with biological or chemical weapons.

IV. DISTINGUISHING AMONG TERRORIST GROUPS

Ever since terrorists turned to hijackings in the 1960s, efforts have been under way to identify the individual characteristics of terrorists. The airline industry has used personality and physical profiles to try to identify potential hijackers, while several scholarly works have been written on the background of terrorists, their childhoods, their personality characteristics, and a variety of other traits.¹ Equally important are assessments of entire terrorist groups, which can reveal important differences among the targets, tactics, and motivations of terrorist organizations.

The likelihood of various terrorist groups to use biological weapons can be compared in several ways. One way is by examining the extent of the groups' state sponsorship, since terrorists backed by foreign governments could overcome many technological obstacles to the use of biological weapons. From facilitating the acquisition of such agents to assistance in transporting and dispersing them, state sponsors could play an important role.

However, a terrorist group would not necessarily need a state sponsor to initiate an attack with biological weapons. Dispersing various biological agents into the atmosphere can be done by "independent" terrorist groups that have some understanding of science. For operations that require more technical knowledge, a terrorist group can always recruit the necessary people. Independent terrorist groups could also acquire biological agents from laboratories and other facilities.

Thus, the degree of state sponsorship of a terrorist group may not necessarily be the determining factor in the use of biological weapons.² Another important factor might be the availability of finances. The more money a terrorist group has, the more options it presumably has. However, some biological agents are very inexpensive to obtain. Some observers have gone so far as to label biological weapons the "poor

¹See, for example, Konrad Kellen, *Terrorists—What Are They Like? How Some Terrorists Describe Their World and Actions*, The RAND Corporation, N-1300-SL, November 1979; and Sue Ellen Moran (ed.), *Court Depositions of Three Red Brigadists*, The RAND Corporation, N-2391-RC, February 1986.

²A separate issue is the use of biological or chemical weapons by foreign governments directly, and not through the proxies of terrorist groups.

man's atomic bomb."³ Thus, wealthier terrorist groups would not necessarily have any special advantage in terms of using biological agents.

Therefore, it is virtually impossible to "predict" which terrorist groups are most likely to embark upon biological terrorist attacks. However, we can identify some basic characteristics that would make certain types of groups more likely than others to experiment with these weapons.

One important characteristic is a perception by the members of a group that biological weapons would not create a backlash among the group's supporters. Thus, nationalistic groups such as the IRA and E.T.A.—which at times have engaged in bombings and shootings that claimed the lives of innocent civilians—would most likely find the possible repercussions of biological weapons too risky. These types of groups depend upon the support—political, logistical, and financial—of significant segments of the population that may not necessarily approve of a group's violent tactics, even though they support its political and territorial objectives. However, the much greater violence of a biological attack and the moral implications of using biological weapons will probably continue to inhibit terrorist groups that are concerned about public opinion.

Groups that have demonstrated a previous pattern of relatively low-level types of attacks are also unlikely candidates for utilizing biological weapons. For example, the Red Brigades, who were very active during the 1970s, killed numerous Italian and Western government, military, and business officials. However, the killings were usually individual assassinations. While such groups could be potential perpetrators of "exotic" types of assassinations (e.g., shooting poison pellets into victims), large-scale biological attacks would be highly unlikely tactics for them. Other groups that have a past history of high-profile but relatively low-casualty-inflicting incidents include the Belgian Communist Combattant Cells (inactive since the mid-1980s) and the West German Revolutionary Cells.

Groups that lack technological sophistication or have never shown a tendency to take high risks in their attacks would also be unlikely

³Neil C. Livingstone and Joseph D. Douglass, Jr., *CBW: The Poor Man's Atomic Bomb*, Institute for Foreign Policy Analysis, Inc., National Security Paper no.1, Cambridge, Mass., January 1984. For a longer treatment of the issue of biological and chemical warfare, see Douglass and Livingstone, *America the Vulnerable*.

⁴As pointed out above, the impact of public opinion on IRA and E.T.A. strategy was evident by each group's "apology" after separate bombings resulted in many civilian deaths. During a meeting of the IRA early in 1989, Gerry Adams, the head of Sinn Féin, the legal political wing of the IRA, called for care in picking targets in order to avoid civilian casualties. (See *Los Angeles Times*, February 12, 1989, p. 2.)

candidates for biological-weapons incidents. While all terrorist activity involves some risk for the terrorists—e.g., the risk of being caught or killed, or of having the operation go wrong—certain types of attacks involve more planning and daring than others. For example, the crash of the Pan Am jetliner in December 1988 was caused by a sophisticated bomb with a two-stage detonating system that included a timer and an altimeter, i.e., a barometric device that measures changes in a plane's altitude. The bomb would explode only when the timer had run its course *and* the plane had reached a certain altitude. The purpose of the altimeter was to ensure that the bomb would not explode while the plane was on the ground without passengers in the event of a delay, while the purpose of the timer was to ensure that either the bomb would not be detected if the suitcase were placed in a decompression chamber at the Frankfurt airport—where the bomb had been first put on a Boeing 727 airliner—or that it would not explode on the Frankfurt-to-London route when it reached a high altitude. The London-to-New York flight involved a Boeing 747 with more passengers—and thus more potential victims—on board.

This incident illustrates the growing sophistication of some terrorist groups. The Popular Front for the Liberation of Palestine-General Command (PFLP-GC), for example, which is a leading suspect in the Pan Am bombing, is technologically very sophisticated, while other groups rely upon relatively simple types of explosives such as pipe bombs or grenades.

Terrorist groups that could conceivably initiate an attack with biological weapons would thus probably exhibit the following characteristics:

- A general, undefined constituency whose possible reaction to a biological-weapons attack does not concern the terrorist group.
- A previous pattern of large-scale, high-casualty-inflicting incidents.
- Demonstration of a certain degree of sophistication in weaponry or tactics.
- A willingness to take risks.

Several terrorist groups can be described as having amorphous constituencies for which concern about a public backlash would not be likely to deter the use of biological weapons. The Japanese Red Army (JRA), for example, whose goals and objectives include vague notions about world revolution, would not be likely to feel any constraints regarding negative public reaction toward a chemical or biological terrorist attack. In 1972, three JRA terrorists, working on behalf of the

PFLP, launched a machinegun and grenade attack at Lod Airport in Tel Aviv, killing 25 people and injuring 76. In an interview in the 1970s, Kozo Okamoto, the lone surviving JRA participant in the Lod Airport massacre, revealed that he had no clear conception of what he was seeking and felt no inhibitions about killing innocent people:

One of the ambiguities of Okamoto's revolutionary conception is that the enemy is not clearly defined. . . . He regards [ordinary people] as faceless, inevitable casualties of the revolution. Because he foresees total overthrow of the existing arrangements of society, he does not feel bound in any way by the moral values of the present world. . . . [But] he is not really certain of what society will be like after the revolution has occurred. This uncertainty about what will come after the all-important revolution requires that he suspend judgment about revolutionary methods. *Since his revolution is not being fought in the name of any specific values, there are no constraints on how it may be fought.* It is not simply a question of ends justifying means, but a more fundamental vagueness about what are ends and what are means. (Italics added)⁵

European left-wing terrorist groups such as the RAF also have undefined constituencies and vague objectives. While the RAF seized upon the issue of intermediate nuclear missiles in Europe to justify a bombing campaign against NATO and U.S. military targets, the group does not have a specific constituency that might inhibit it from unleashing biological agents.⁶ Neo-Nazi groups, both in the United States and in Europe, would also be unlikely to feel any restraints because of public opinion. In fact, one U.S. white-supremacist group plotted during the early 1980s to poison the water supplies of Chicago and Washington, D.C. A police and federal government raid on the group's headquarters in Arkansas in 1984 uncovered a stockpile of 30 gallons of cyanide.⁷

Another important factor in the likelihood of a group using biological or chemical weapons is the group's previous level of violence. Although all terrorist groups are "violent," some are clearly more violent than others, in terms of the number of casualties per incident. Pro-Iranian Shiite fundamentalist groups, such as *Hizbollah*, and Palestinian extremists, such as the Abu Nidal organization, have been par-

⁵Patricia Steinhoff, "Portrait of a Terrorist: An Interview with Kozo Okamoto," *Asian Survey*, September 1976, pp. 844-845.

⁶The RAF, as noted in Sec. II, has already produced a culture medium of *Clostridium botulinum* and has made threats in the past concerning the use of biological and chemical agents. One unconfirmed report—which authorities denied—stated that RAF members during the spring of 1989 had secretly photographed the Federal Research Institute for Animal Virus Diseases in Tuebingen, West Germany, in order to steal infectious viruses. See Risks International, Inc., *Risk Assessment Weekly*, Vol. 6, No. 20, May 19, 1989, p. 3.

⁷Bruce Hoffman, "The Contrasting Ethical Foundations of Terrorism in the 1980s," The RAND Corporation, P-7416, January 1988, p. 21.

ticularly violent in the 1980s. *Hizbollah* was responsible for the suicide truck bombing at the U.S. Marine barracks in Lebanon that killed 241 Marines, as well as bombings of the U.S. Embassy and the French peacekeeping troops headquarters. Abu Nidal was responsible for the simultaneous massacres at El Al ticket counters at the Rome and Vienna airports during the 1985 Christmas season that killed 20 people and injured 101, and for the massacre of 22 Jewish worshippers at an Istanbul synagogue in September 1986. There have also been unconfirmed reports that *Hizbollah* is having a Shiite scientist manufacture toxic gases.⁸

The suicide truck and car bombings perpetrated by Islamic fundamentalists in the early 1980s illustrate how a belief in martyrdom can justify any type of terrorist attack. Furthermore, since there are many factions within both the Islamic and Palestinian movements, internal divisions could lead certain factions to decide that a higher level of killing is necessary to preserve their own goals.

Other highly violent terrorist groups include the JRA and Sikh extremists in India. Although the JRA has not perpetrated any large-scale attacks since the Lod Airport massacre, one member of the group, Yu Kikumura, was arrested in the United States in 1988 and convicted of possessing three powerful bombs. Sikh extremists were responsible for the blowing up of an Air India plane in 1985 which killed more than 300 people and for the massacres of large groups of Hindus.

Since the number of deaths and injuries in large-scale conventional terrorist incidents is minuscule compared with the potential casualties that would result from most chemical or biological attacks, the fact that a group has inflicted hundreds of deaths in a single incident does not necessarily mean that it would venture into the world of biological warfare. A key factor, therefore, in any decision to escalate to biological or chemical attacks would be a perception by the group that conventional bombings, hijackings, and shootings no longer serve the group's objectives and that more violence is necessary. A group might perceive a need to generate more publicity in an environment where traditional types of terrorist attacks no longer get extensive media coverage, or it might feel a need to take advantage of new types of weapons as they become available.

Terrorist groups that have demonstrated a certain degree of technical sophistication and a willingness to take risks in their attacks might also be more likely to consider using biological or chemical weapons. The PFLP-GC, as pointed out above, is suspected of placing sophisticated plastic explosives aboard Pan Am Flight 103. A few weeks

⁸FBIS, June 23, 1987, p. L2.

prior to that incident, West German police raided a PFLP-GC cell and discovered 10.5 ounces of plastic explosives hidden inside a portable radio.⁹

While placing anthrax spores into a device for aerial dispersion might prove more risky for terrorists and might require more scientific knowledge than designing a bomb, groups that have favored high-technology weapons would nevertheless be more likely to experiment with different types of lethal weapons than would less-inventive groups.

Finally, the threat of guerrilla armies acquiring and using biological or chemical weapons has implications for the potential use of these weapons by terrorists. While the distinction between terrorists and guerrillas is sometimes unclear, there are nevertheless some real differences. Guerrilla armies are usually larger and better organized, and they pursue different tactics and goals than terrorist groups (e.g., engaging the military forces of a government in skirmishes, attempting to win the support of—or intimidate—peasants, gaining territory, etc.). While terrorism may be a part of guerrilla strategy, it is not its defining characteristic. However, if guerrillas begin using biological or chemical weapons, it is likely that terrorist groups will eventually follow suit, since terrorists tend to copy what they perceive to be successful tactics by other terrorists or other groups. With guerrillas acquiring increasingly sophisticated weapons from state supporters and on the international arms market, the potential for biological or chemical weapons to become a part of guerrilla warfare may not be very remote.

The difficulties of identifying potential terrorist users of biological weapons makes the role of intelligence critical in attempting to combat the terrorist threat. The nature of terrorism precludes predictions of the exact target, tactic, or weapon that a terrorist group may use, and situations can change or opportunities arise that may make even the most unlikely terrorist group consider using biological agents.

Counterterrorist intelligence, however, is more of an art than a science. It ranges from trying to track the worldwide movements of known terrorists to uncovering plots for specific operations. Many pieces of information have to be sorted out, and it is often necessary to obtain the cooperation of other government intelligence agencies. Because failure to prevent even a single biological-weapons incident could prove disastrous, intelligence officials will be under increased pressure to uncover any such plots. While there is no blueprint that can be followed, there are some indicators that could point to a terrorist group planning a biological-agent attack. These include recruitment

⁹*New York Times*, February 17, 1989, p. 6.

of new members who have scientific backgrounds; contacts with scientific laboratories or attempts to purchase or steal biological agents; and suspicious inquiries by individuals concerning infectious diseases. Furthermore, the activities of state sponsors of terrorism must be continually monitored to uncover any movement toward the development of biological weapons.

V. CONCLUSION

The possibility that terrorists may one day use biological agents cannot be ignored. Although the risk today is quite low, the technological, logistical, and financial barriers to using such weapons are not insurmountable. The key determining factor is likely to be the willingness of terrorists to engage in this most deadly type of conflict.

Recent trends in terrorism have shown that terrorists have become more violent in their attacks. Shooting down airliners, planting bombs aboard planes, and massacring civilians on buses and in villages have all become regular elements of the terrorist repertoire.

This higher level of bloodshed, however, does not automatically translate into the use of biological agents. There are many constraints that may inhibit groups from venturing into the world of biological warfare, e.g., unwillingness to experiment with unfamiliar weapons or uncertainty about the possible political repercussions of inflicting mass casualties.

There are indications, however, that these constraints may be weakening. The knowledge necessary for using many types of biological agents is not beyond university-educated terrorists. And the rise of state-sponsored terrorism facilitates the acquisition and potential dispersal of even the most sophisticated biological agents.

The threshold for taking multiple lives is also declining as religiously inspired terrorism increases. The belief that one's acts of violence will be rewarded in the afterlife is a powerful incentive for even higher levels of violence.

Since physical security measures against terrorists with biological weapons cannot be foolproof, the consequences of terrorists even *attempting* such an attack will be serious. This makes the task of uncovering terrorist groups' strategies and capabilities all the more critical.

Terrorism will continue to be a problem. While it is not necessarily true, as some observers have claimed, that "time is running out,"¹ we cannot afford to be complacent about the threat of terrorists using biological weapons. Hijackings and hostage episodes do not threaten our national security. The same cannot be said for terrorists with biological weapons.

¹Douglass and Livingstone, *America the Vulnerable*, p. 169.

REFERENCES

- Beckett, Brian, *Weapons of Tomorrow*, London, Orbis Publishing, 1982.
- Carley, William, "Their Secrets Revealed, Abu Nidal's Terrorists Are Becoming Targets," *Wall Street Journal*, October 15, 1987.
- Clark, Richard Charles, *Technological Terrorism*, Old Greenwich, Conn., The Devin-Adair Company, 1980.
- > Douglass, Joseph D., Jr., and Neil C. Livingstone, *America the Vulnerable: The Threat of Chemical and Biological Warfare*, Lexington, Mass., D.C. Heath and Co., 1987.
- Foreign Broadcast Information Service, December 19, 1980, June 9, 1987, June 23, 1987, January 13, 1988, May 19, 1989.
- Hoffman, Bruce, et al., *A Reassessment of Potential Adversaries to U.S. Nuclear Programs*, The RAND Corporation, R-3363-DOE, March 1986.
- , *The Contrasting Ethical Foundations of Terrorism in the 1980s*, The RAND Corporation, P-7416, January 1988.
- International Herald Tribune*, April 23, 1980, November 8–9, 1980.
- Jenkins, Brian M., *Future Trends in International Terrorism*, The RAND Corporation, P-7176, December 1985.
- , "Italian Terrorism: Recent Developments," *TVI Report*, Vol. 7, No. 3.
- Kellen, Konrad, *Terrorists—What Are They Like? How Some Terrorists Describe Their World and Actions*, The RAND Corporation, N-1300-SL, November 1979.
- Lightbody, Andy, and Joe Poyer, "Worldwide Terror," *International Combat Arms*, November 1987.
- Livingstone, Neil C., and Joseph D. Douglass, Jr., *CBW: The Poor Man's Atomic Bomb*, Institute for Foreign Policy Analysis, Inc., National Security Paper No.1, Cambridge, Mass., January 1984.
- Los Angeles Times*, February 12, 1989.
- McCormick, Gordon H., *The Shining Path and Peruvian Terrorism*, P-7297, The RAND Corporation, January 1987.
- Moran, Sue Ellen (ed.), *Court Depositions of Three Red Brigadists*, The RAND Corporation, N-2391-RC, February 1986.
- New York Times*, September 19, 1975, February 17, 1989.
- Rechtschaffen, O. R., "Abu Nidal—"The Deadliest Terrorist Alive," *Officer Review*, September 1987, p. 9.
- Risks International, Inc., *Risk Assessment Weekly*, Vol. 6, No. 20, May 19, 1989.

- Simon, Jeffrey D., "Misunderstanding Terrorism," *Foreign Policy*, Summer 1987, pp. 104-120.
- Steinhoff, Patricia, "Portrait of a Terrorist: An Interview with Kozo Okamoto," *Asian Survey*, September 1976, pp. 844-845.
- World Health Organization, *Health Aspects of Chemical and Biological Weapons*, Geneva, 1970.

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Presidential Documents

Title 3—**The President****Executive Order 12656 of November 18, 1988****Assignment of Emergency Preparedness Responsibilities**

WHEREAS our national security is dependent upon our ability to assure continuity of government, at every level, in any national security emergency situation that might confront the Nation; and

WHEREAS effective national preparedness planning to meet such an emergency, including a massive nuclear attack, is essential to our national survival; and

WHEREAS effective national preparedness planning requires the identification of functions that would have to be performed during such an emergency, the assignment of responsibility for developing plans for performing these functions, and the assignment of responsibility for developing the capability to implement those plans; and

WHEREAS the Congress has directed the development of such national security emergency preparedness plans and has provided funds for the accomplishment thereof;

NOW, THEREFORE, by virtue of the authority vested in me as President by the Constitution and laws of the United States of America, and pursuant to Reorganization Plan No. 1 of 1958 (72 Stat. 1799), the National Security Act of 1947, as amended, the Defense Production Act of 1950, as amended, and the Federal Civil Defense Act, as amended, it is hereby ordered that the responsibilities of the Federal departments and agencies in national security emergencies shall be as follows:

PART 1—Preamble**Section 101. National Security Emergency Preparedness Policy.**

(a) The policy of the United States is to have sufficient capabilities at all levels of government to meet essential defense and civilian needs during any national security emergency. A national security emergency is any occurrence, including natural disaster, military attack, technological emergency, or other emergency, that seriously degrades or seriously threatens the national security of the United States. Policy for national security emergency preparedness shall be established by the President. Pursuant to the President's direction, the National Security Council shall be responsible for developing and administering such policy. All national security emergency preparedness activities shall be consistent with the Constitution and laws of the United States and with preservation of the constitutional government of the United States.

(b) Effective national security emergency preparedness planning requires: identification of functions that would have to be performed during such an emergency; development of plans for performing these functions; and development of the capability to execute those plans.

Sec. 102. Purpose.

(a) The purpose of this Order is to assign national security emergency preparedness responsibilities to Federal departments and agencies. These assignments are based, whenever possible, on extensions of the regular missions of the departments and agencies.

(b) This Order does not constitute authority to implement the plans prepared pursuant to this Order. Plans so developed may be executed only in the event that authority for such execution is authorized by law.

Sec. 103. Scope.

(a) This Order addresses national security emergency preparedness functions and activities. As used in this Order, preparedness functions and activities include, as appropriate, policies, plans, procedures, and readiness measures that enhance the ability of the United States Government to mobilize for, respond to, and recover from a national security emergency.

(b) This Order does not apply to those natural disasters, technological emergencies, or other emergencies, the alleviation of which is normally the responsibility of individuals, the private sector, volunteer organizations, State and local governments, and Federal departments and agencies unless such situations also constitute a national security emergency.

(c) This Order does not require the provision of information concerning, or evaluation of, military policies, plans, programs, or states of military readiness.

(d) This Order does not apply to national security emergency preparedness telecommunications functions and responsibilities that are otherwise assigned by Executive Order 12472.

Sec. 104. Management of National Security Emergency Preparedness.

(a) The National Security Council is the principal forum for consideration of national security emergency preparedness policy.

(b) The National Security Council shall arrange for Executive branch liaison with, and assistance to, the Congress and the Federal judiciary on national security-emergency preparedness matters.

(c) The Director of the Federal Emergency Management Agency shall serve as an advisor to the National Security Council on issues of national security emergency preparedness, including mobilization preparedness, civil defense, continuity of government, technological disasters, and other issues, as appropriate. Pursuant to such procedures for the organization and management of the National Security Council process as the President may establish, the Director of the Federal Emergency Management Agency also shall assist in the implementation of and management of the National Security Council process as the President may establish, the Director of the Federal Emergency Management Agency also shall assist in the implementation of national security emergency preparedness policy by coordinating with the other Federal departments and agencies and with State and local governments, and by providing periodic reports to the National Security Council on implementation of national security emergency preparedness policy.

(d) National security emergency preparedness functions that are shared by more than one agency shall be coordinated by the head of the Federal department or agency having primary responsibility and shall be supported by the heads of other departments and agencies having related responsibilities.

(e) There shall be a national security emergency exercise program that shall be supported by the heads of all appropriate Federal departments and agencies.

(f) Plans and procedures will be designed and developed to provide maximum flexibility to the President for his implementation of emergency actions.

Sec. 105. Interagency Coordination.

(a) All appropriate Cabinet members and agency heads shall be consulted regarding national security emergency preparedness programs and policy issues. Each department and agency shall support interagency coordination to improve preparedness and response to a national security emergency and

shall develop and maintain decentralized capabilities wherever feasible and appropriate.

(b) Each Federal department and agency shall work within the framework established by, and cooperate with those organizations assigned responsibility in, Executive Order No. 12472, to ensure adequate national security emergency preparedness telecommunications in support of the functions and activities addressed by this Order.

PART 2—General Provisions

Sec. 201. General. The head of each Federal department and agency, as appropriate, shall:

(1) Be prepared to respond adequately to all national security emergencies, including those that are international in scope, and those that may occur within any region of the Nation;

(2) Consider national security emergency preparedness factors in the conduct of his or her regular functions, particularly those functions essential in time of emergency. Emergency plans and programs, and an appropriate state of readiness, including organizational infrastructure, shall be developed as an integral part of the continuing activities of each Federal department and agency;

(3) Appoint a senior policy official as Emergency Coordinator, responsible for developing and maintaining a multi-year, national security emergency preparedness plan for the department or agency to include objectives, programs, and budgetary requirements;

(4) Design preparedness measures to permit a rapid and effective transition from routine to emergency operations, and to make effective use of the period following initial indication of a probable national security emergency. This will include:

(a) Development of a system of emergency actions that defines alternatives, processes, and issues to be considered during various stages of national security emergencies;

(b) Identification of actions that could be taken in the early stages of a national security emergency or pending national security emergency to mitigate the impact of or reduce significantly the lead times associated with full emergency action implementation;

(5) Base national security emergency preparedness measures on the use of existing authorities, organizations, resources, and systems to the maximum extent practicable;

(6) Identify areas where additional legal authorities may be needed to assist management and, consistent with applicable Executive orders, take appropriate measures toward acquiring those authorities;

(7) Make policy recommendations to the National Security Council regarding national security emergency preparedness activities and functions of the Federal Government;

(8) Coordinate with State and local government agencies and other organizations, including private sector organizations, when appropriate. Federal plans should include appropriate involvement of and reliance upon private sector organizations in the response to national security emergencies;

(9) Assist State, local, and private sector entities in developing plans for mitigating the effects of national security emergencies and for providing services that are essential to a national response;

(10) Cooperate, to the extent appropriate, in compiling, evaluating, and exchanging relevant data related to all aspects of national security emergency preparedness;

(11) Develop programs regarding congressional relations and public information that could be used during national security emergencies;

(12) Ensure a capability to provide, during a national security emergency, information concerning Acts of Congress, presidential proclamations, Executive orders, regulations, and notices of other actions to the Archivist of the United States, for publication in the **Federal Register**, or to each agency designated to maintain the **Federal Register** in an emergency;

(13) Develop and conduct training and education programs that incorporate emergency preparedness and civil defense information necessary to ensure an effective national response;

(14) Ensure that plans consider the consequences for essential services provided by State and local governments, and by the private sector, if the flow of Federal funds is disrupted;

(15) Consult and coordinate with the Director of the Federal Emergency Management Agency to ensure that those activities and plans are consistent with current National Security Council guidelines and policies.

Sec. 202. Continuity of Government. The head of each Federal department and agency shall ensure the continuity of essential functions in any national security emergency by providing for: succession to office and emergency delegation of authority in accordance with applicable law; safekeeping of essential resources, facilities, and records; and establishment of emergency operating capabilities.

Sec. 203. Resource Management. The head of each Federal department and agency, as appropriate within assigned areas of responsibility, shall:

(1) Develop plans and programs to mobilize personnel (including reservist programs), equipment, facilities, and other resources;

(2) Assess essential emergency requirements and plan for the possible use of alternative resources to meet essential demands during and following national security emergencies;

(3) Prepare plans and procedures to share between and among the responsible agencies resources such as energy, equipment, food, land, materials, minerals, services, supplies, transportation, water, and workforce needed to carry out assigned responsibilities and other essential functions, and cooperate with other agencies in developing programs to ensure availability of such resources in a national security emergency;

(4) Develop plans to set priorities and allocate resources among civilian and military claimants;

(5) Identify occupations and skills for which there may be a critical need in the event of a national security emergency.

Sec. 204. Protection of Essential Resources and Facilities. The head of each Federal department and agency, within assigned areas of responsibility, shall:

(1) Identify facilities and resources, both government and private, essential to the national defense and national welfare, and assess their vulnerabilities and develop strategies, plans, and programs to provide for the security of such facilities and resources, and to avoid or minimize disruptions of essential services during any national security emergency;

(2) Participate in interagency activities to assess the relative importance of various facilities and resources to essential military and civilian needs and to integrate preparedness and response strategies and procedures;

(3) Maintain a capability to assess promptly the effect of attack and other disruptions during national security emergencies.

Sec. 205. Federal Benefit, Insurance, and Loan Programs. The head of each Federal department and agency that administers a loan, insurance, or benefit program that relies upon the Federal Government payment system shall

coordinate with the Secretary of the Treasury in developing plans for the continuation or restoration, to the extent feasible, of such programs in national security emergencies.

Sec. 206. Research. The Director of the Office of Science and Technology Policy and the heads of Federal departments and agencies having significant research and development programs shall advise the National Security Council of scientific and technological developments that should be considered in national security emergency preparedness planning.

Sec. 207. Redelegation. The head of each Federal department and agency is hereby authorized, to the extent otherwise permitted by law, to redelegate the functions assigned by this Order, and to authorize successive redelegations to organizations, officers, or employees within that department or agency.

Sec. 208. Transfer of Functions. Recommendations for interagency transfer of any emergency preparedness function assigned under this Order or for assignment of any new emergency preparedness function shall be coordinated with all affected Federal departments and agencies before submission to the National Security Council.

Sec. 209. Retention of Existing Authority. Nothing in this Order shall be deemed to derogate from assignments of functions to any Federal department or agency or officer thereof made by law.

PART 3—Department of Agriculture

Sec. 301. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Agriculture shall:

(1) Develop plans to provide for the continuation of agricultural production, food processing, storage, and distribution through the wholesale level in national security emergencies, and to provide for the domestic distribution of seed, feed, fertilizer, and farm equipment to agricultural producers;

(2) Develop plans to provide food and agricultural products to meet international responsibilities in national security emergencies;

(3) Develop plans and procedures for administration and use of Commodity Credit Corporation inventories of food and fiber resources in national security emergencies;

(4) Develop plans for the use of resources under the jurisdiction of the Secretary of Agriculture and, in cooperation with the Secretaries of Commerce, Defense, and the Interior, the Board of Directors of the Tennessee Valley Authority, and the heads of other government entities, plan for the national security emergency management, production, and processing of forest products;

(5) Develop, in coordination with the Secretary of Defense, plans and programs for water to be used in agricultural production and food processing in national security emergencies;

(6) In cooperation with Federal, State, and local agencies, develop plans for a national program relating to the prevention and control of fires in rural areas of the United States caused by the effects of enemy attack or other national security emergencies;

(7) Develop plans to help provide the Nation's farmers with production resources, including national security emergency financing capabilities;

(8) Develop plans, in consonance with those of the Department of Health and Human Services, the Department of the Interior, and the Environmental Protection Agency, for national security emergency agricultural health services and forestry, including:

(a) Diagnosis and control or eradication of diseases, pests, or hazardous agents (biological, chemical, or radiological) against animals, crops, timber, or products thereof;

(b) Protection, treatment, and handling of livestock and poultry, or products thereof, that have been exposed to or affected by hazardous agents;

(c) Use and handling of crops, agricultural commodities, timber, and agricultural lands that have been exposed to or affected by hazardous agents; and

(d) Assuring the safety and wholesomeness, and minimizing losses from hazards, of animals and animal products and agricultural commodities and products subject to continuous inspection by the Department of Agriculture or owned by the Commodity Credit Corporation or by the Department of Agriculture;

(9) In consultation with the Secretary of State and the Director of the Federal Emergency Management Agency, represent the United States in agriculture-related international civil emergency preparedness planning and related activities.

Sec. 302. Support Responsibility. The Secretary of Agriculture shall assist the Secretary of Defense in formulating and carrying out plans for stockpiling strategic and critical agricultural materials.

PART 4—Department of Commerce

Sec. 401. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Commerce shall:

(1) Develop control systems for priorities, allocation, production, and distribution of materials and other resources that will be available to support both national defense and essential civilian programs in a national security emergency;

(2) In cooperation with the Secretary of Defense and other departments and agencies, identify those industrial products and facilities that are essential to mobilization readiness, national defense, or post-attack survival and recovery;

(3) In cooperation with the Secretary of Defense and other Federal departments and agencies, analyze potential effects of national security emergencies on actual production capability, taking into account the entire production complex, including shortages of resources, and develop preparedness measures to strengthen capabilities for production increases in national security emergencies;

(4) In cooperation with the Secretary of Defense, perform industry analyses to assess capabilities of the commercial industrial base to support the national defense, and develop policy alternatives to improve the international competitiveness of specific domestic industries and their abilities to meet defense program needs;

(5) In cooperation with the Secretary of the Treasury, develop plans for providing emergency assistance to the private sector through direct or participation loans for the financing of production facilities and equipment;

(6) In cooperation with the Secretaries of State, Defense, Transportation, and the Treasury, prepare plans to regulate and control exports and imports in national security emergencies;

(7) Provide for the collection and reporting of census information on human and economic resources, and maintain a capability to conduct emergency surveys to provide information on the status of these resources as required for national security purposes;

(8) Develop overall plans and programs to ensure that the fishing industry continues to produce and process essential protein in national security emergencies;

(9) Develop plans to provide meteorological, hydrologic, marine weather, geodetic, hydrographic, climatic, seismic, and oceanographic data and services to Federal, State, and local agencies, as appropriate;

(10) In coordination with the Secretary of State and the Director of the Federal Emergency Management Agency, represent the United States in industry-related international (NATO and allied) civil emergency preparedness planning and related activities.

Sec. 402. Support Responsibilities. The Secretary of Commerce shall:

- (1) Assist the Secretary of Defense in formulating and carrying out plans for stockpiling strategic and critical materials;
- (2) Support the **Secretary of Agriculture** in planning for the national security management, production, and processing of forest and fishery products;
- (3) Assist, in consultation with the Secretaries of State and Defense, the Secretary of the Treasury in the formulation and execution of economic measures affecting other nations.

PART 5—Department of Defense

Sec. 501. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Defense shall:

- (1) Ensure military preparedness and readiness to respond to national security emergencies;
- (2) In coordination with the Secretary of Commerce, develop, with industry, government, and the private sector, reliable capabilities for the rapid increase of defense production to include industrial resources required for that production;
- (3) Develop and maintain, in cooperation with the heads of other departments and agencies, national security emergency plans, programs, and mechanisms to ensure effective mutual support between and among the military, civil government, and the private sector;
- (4) Develop and maintain damage assessment capabilities and assist the Director of the Federal Emergency Management Agency and the heads of other departments and agencies in developing and maintaining capabilities to assess attack damage and to estimate the effects of potential attack on the Nation;
- (5) Arrange, through agreements with the heads of other Federal departments and agencies, for the transfer of certain Federal resources to the jurisdiction and/or operational control of the Department of Defense in national security emergencies;
- (6) Acting through the Secretary of the Army, develop, with the concurrence of the heads of all affected departments and agencies, overall plans for the management, control, and allocation of all usable waters from all sources within the jurisdiction of the United States. This includes:
 - (a) Coordination of national security emergency water resource planning at the national, regional, State, and local levels;
 - (b) Development of plans to assure emergency provision of water from public works projects under the jurisdiction of the Secretary of the Army to public water supply utilities and critical defense production facilities during national security emergencies;
 - (c) Development of plans to assure emergency operation of waterways and harbors; and
 - (d) Development of plans to assure the provision of potable water;
- (7) In consultation with the Secretaries of State and Energy, the Director of the Federal Emergency Management Agency, and others, as required, develop plans and capabilities for identifying, analyzing, mitigating, and responding to hazards related to nuclear weapons, materials, and devices; and maintain liaison, as appropriate, with the Secretary of Energy and the Members of the Nuclear Regulatory Commission to ensure the continuity of nuclear weapons production and the appropriate allocation of scarce resources, including the

recapture of special nuclear materials from Nuclear Regulatory Commission licensees when appropriate;

(8) Coordinate with the Administrator of the National Aeronautics and Space Administration and the Secretary of Energy, as appropriate, to prepare for the use, maintenance, and development of technologically advanced aerospace and aeronautical-related systems, equipment, and methodologies applicable to national security emergencies;

(9) Develop, in coordination with the Secretary of Labor, the Directors of the Selective Service System, the Office of Personnel Management, and the Federal Emergency Management Agency, plans and systems to ensure that the Nation's human resources are available to meet essential military and civilian needs in national security emergencies;

(10) Develop national security emergency operational procedures, and coordinate with the Secretary of Housing and Urban Development with respect to residential property, for the control, acquisition, leasing, assignment and priority of occupancy of real property within the jurisdiction of the Department of Defense;

(11) Review the priorities and allocations systems developed by other departments and agencies to ensure that they meet Department of Defense needs in a national security emergency; and develop and maintain the Department of Defense programs necessary for effective utilization of all priorities and allocations systems;

(12) Develop, in coordination with the Attorney General of the United States, specific procedures by which military assistance to civilian law enforcement authorities may be requested, considered, and provided;

(13) In cooperation with the Secretary of Commerce and other departments and agencies, identify those industrial products and facilities that are essential to mobilization readiness, national defense, or post-attack survival and recovery;

(14) In cooperation with the Secretary of Commerce and other Federal departments and agencies, analyze potential effects of national security emergencies on actual production capability, taking into account the entire production complex, including shortages of resources, and develop preparedness measures to strengthen capabilities for production increases in national security emergencies;

(15) With the assistance of the heads of other Federal departments and agencies, provide management direction for the stockpiling of strategic and critical materials, conduct storage, maintenance, and quality assurance operations for the stockpile of strategic and critical materials, and formulate plans, programs, and reports relating to the stockpiling of strategic and critical materials.

Sec. 502. Support Responsibilities. The Secretary of Defense shall:

(1) Advise and assist the heads of other Federal departments and agencies in the development of plans and programs to support national mobilization. This includes providing, as appropriate:

(a) Military requirements, prioritized and time-phased to the extent possible, for selected end-items and supporting services, materials, and components;

(b) Recommendations for use of financial incentives and other methods to improve defense production as provided by law; and

(c) Recommendations for export and import policies;

(2) Advise and assist the Secretary of State and the heads of other Federal departments and agencies, as appropriate, in planning for the protection, evacuation, and repatriation of United States citizens in threatened areas overseas;

(3) Support the Secretary of Housing and Urban Development and the heads of other agencies, as appropriate, in the development of plans to restore community facilities;

(4) Support the Secretary of Energy in international liaison activities pertaining to nuclear materials facilities;

(5) In consultation with the Secretaries of State and Commerce, assist the Secretary of the Treasury in the formulation and execution of economic measures that affect other nations;

(6) Support the Secretary of State and the heads of other Federal departments and agencies as appropriate in the formulation and implementation of foreign policy, and the negotiation of contingency and post-emergency plans, intergovernmental agreements, and arrangements with allies and friendly nations, which affect national security;

(7) Coordinate with the Director of the Federal Emergency Management Agency the development of plans for mutual civil-military support during national security emergencies;

(8) Develop plans to support the Secretary of Labor in providing education and training to overcome shortages of critical skills.

PART 6—Department of Education

Sec. 601. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Education shall:

(1) Assist school systems in developing their plans to provide for the earliest possible resumption of activities following national security emergencies;

(2) Develop plans to provide assistance, including efforts to meet shortages of critical educational personnel, to local educational agencies;

(3) Develop plans, in coordination with the Director of the Federal Emergency Management Agency, for dissemination of emergency preparedness instructional material through educational institutions and the media during national security emergencies.

Sec. 602. *Support responsibilities.* The Secretary of Education shall:

(1) Develop plans to support the Secretary of Labor in providing education and training to overcome shortages of critical skills;

(2) Support the Secretary of Health and Human Services in the development of human services educational and training materials, including self-help program materials for use by human service organizations and professional schools.

PART 7—Department of Energy

Sec. 701. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Energy shall:

(1) Conduct national security emergency preparedness planning, including capabilities development, and administer operational programs for all energy resources, including:

(a) Providing information, in cooperation with Federal, State, and energy industry officials, on energy supply and demand conditions and on the requirements for and the availability of materials and services critical to energy supply systems;

(b) In coordination with appropriate departments and agencies and in consultation with the energy industry, develop implementation plans and operational systems for priorities and allocation of all energy resource requirements for national defense and essential civilian needs to assure national security emergency preparedness;

(c) Developing, in consultation with the Board of Directors of the Tennessee Valley Authority, plans necessary for the integration of its power system into the national supply system;

(2) Identify energy facilities essential to the mobilization, deployment, and sustainment of resources to support the national security and national welfare, and develop energy supply and demand strategies to ensure continued provision of minimum essential services in national security emergencies;

(3) In coordination with the Secretary of Defense, ensure continuity of nuclear weapons production consistent with national security requirements;

(4) Assure the security of nuclear materials, nuclear weapons, or devices in the custody of the Department of Energy, as well as the security of all other Department of Energy programs and facilities;

(5) In consultation with the Secretaries of State and Defense and the Director of the Federal Emergency Management Agency, conduct appropriate international liaison activities pertaining to matters within the jurisdiction of the Department of Energy;

(6) In consultation with the Secretaries of State and Defense, the Director of the Federal Emergency Management Agency, the Members of the Nuclear Regulatory Commission, and others, as required, develop plans and capabilities for identification, analysis, damage assessment, and mitigation of hazards from nuclear weapons, materials, and devices;

(7) Coordinate with the Secretary of Transportation in the planning and management of transportation resources involved in the bulk movement of energy;

(8) At the request of or with the concurrence of the Nuclear Regulatory Commission and in consultation with the Secretary of Defense, recapture special nuclear materials from Nuclear Regulatory Commission licensees where necessary to assure the use, preservation, or safeguarding of such material for the common defense and security;

(9) Develop national security emergency operational procedures for the control, utilization, acquisition, leasing, assignment, and priority of occupancy of real property within the jurisdiction of the Department of Energy;

(10) Manage all emergency planning and response activities pertaining to Department of Energy nuclear facilities.

Sec. 702. Support Responsibilities. The Secretary of Energy shall:

(1) Provide advice and assistance, in coordination with appropriate agencies, to Federal, State, and local officials and private sector organizations to assess the radiological impact associated with national security emergencies;

(2) Coordinate with the Secretaries of Defense and the Interior regarding the operation of hydroelectric projects to assure maximum energy output;

(3) Support the Secretary of Housing and Urban Development and the heads of other agencies, as appropriate, in the development of plans to restore community facilities;

(4) Coordinate with the Secretary of Agriculture regarding the emergency preparedness of the rural electric supply systems throughout the Nation and the assignment of emergency preparedness responsibilities to the Rural Electrification Administration.

PART 8—Department of Health and Human Services

Sec. 801. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Health and Human Services shall:

(1) Develop national plans and programs to mobilize the health industry and health resources for the provision of health, mental health, and medical services in national security emergencies;

(2) Promote the development of State and local plans and programs for provision of health, mental health, and medical services in national security emergencies;

(3) Develop national plans to set priorities and allocate health, mental health, and medical services' resources among civilian and military claimants;

(4) Develop health and medical survival information programs and a nationwide program to train health and mental health professionals and paraprofessionals in **special knowledge and skills** that would be useful in national security emergencies;

(5) Develop programs to reduce or eliminate adverse health and mental health effects produced by hazardous agents (biological, chemical, or radiological), and, in coordination with appropriate Federal agencies, develop programs to minimize property and environmental damage associated with national security emergencies;

(6) Develop guidelines that will assure reasonable and prudent standards of purity and/or safety in the manufacture and distribution of food, drugs, biological products, medical devices, food additives, and radiological products in national security emergencies;

(7) Develop national plans for assisting State and local governments in rehabilitation of persons injured or disabled during national security emergencies;

(8) Develop plans and procedures to assist State and local governments in the provision of emergency human services, including lodging, feeding, clothing, registration and inquiry, social services, family reunification and mortuary services and interment;

(9) Develop, in coordination with the Secretary of Education, human services educational and training materials for use by human service organizations and professional schools; and develop and distribute, in coordination with the Director of the Federal Emergency Management Agency, civil defense information relative to emergency human services;

(10) Develop plans and procedures, in coordination with the heads of Federal departments and agencies, for assistance to United States citizens or others evacuated from overseas areas.

Sec. 802. Support Responsibility. The Secretary of Health and Human Services shall support the Secretary of Agriculture in the development of plans related to national security emergency agricultural health services.

PART 9—Department of Housing and Urban Development

Sec. 901. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Housing and Urban Development shall:

(1) Develop plans for provision and management of housing in national security emergencies, including:

(a) Providing temporary housing using Federal financing and other arrangements;

(b) Providing for radiation protection by encouraging voluntary construction of shelters and voluntary use of cost-efficient design and construction techniques to maximize population protection;

(2) Develop plans, in cooperation with the heads of other Federal departments and agencies and State and local governments, to restore community facilities, including electrical power, potable water, and sewage disposal facilities, damaged in national security emergencies.

PART 10—Department of the Interior

Sec. 1001. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of the Interior shall:

- (1) Develop programs and encourage the exploration, development, and mining of strategic and critical and other nonfuel minerals for national security emergency purposes;
- (2) Provide guidance to mining industries in the development of plans and programs to ensure continuity of production during national security emergencies;
- (3) Develop and implement plans for the management, control, allocation, and use of public land under the jurisdiction of the Department of the Interior in national security emergencies and coordinate land emergency planning at the Federal, State, and local levels.

Sec. 1002. *Support Responsibilities.* The Secretary of the Interior shall:

- (1) Assist the Secretary of Defense in formulating and carrying out plans for stockpiling strategic and critical minerals;
- (2) Cooperate with the Secretary of Commerce in the identification and evaluation of facilities essential for national security emergencies;
- (3) Support the Secretary of Agriculture in planning for the national security management, production, and processing of forest products.

PART 11—Department of Justice

Sec. 1101. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Attorney General of the United States shall:

- (1) Provide legal advice to the President and the heads of Federal departments and agencies and their successors regarding national security emergency powers, plans, and authorities;
- (2) Coordinate Federal Government domestic law enforcement activities related to national security emergency preparedness, including Federal law enforcement liaison with, and assistance to, State and local governments;
- (3) Coordinate contingency planning for national security emergency law enforcement activities that are beyond the capabilities of State and local agencies;
- (4) Develop national security emergency plans for regulation of immigration, regulation of nationals of enemy countries, and plans to implement laws for the control of persons entering or leaving the United States;
- (5) Develop plans and procedures for the custody and protection of prisoners and the use of Federal penal and correctional institutions and resources during national security emergencies;
- (6) Provide information and assistance to the Federal Judicial branch and the Federal Legislative branch concerning law enforcement, continuity of government, and the exercise of legal authority during national security emergencies;
- (7) Develop intergovernmental and interagency law enforcement plans and counterterrorism programs to interdict and respond to terrorism incidents in the United States that may result in a national security emergency or that occur during such an emergency;
- (8) Develop intergovernmental and interagency law enforcement plans to respond to civil disturbances that may result in a national security emergency or that occur during such an emergency.

Sec. 1102. *Support Responsibilities.* The Attorney General of the United States shall:

- (1) Assist the heads of Federal departments and agencies, State and local governments, and the private sector in the development of plans to physically protect essential resources and facilities;

(2) Support the Secretaries of State and the Treasury in plans for the protection of international organizations and foreign diplomatic, consular, and other official personnel, property, and other assets within the jurisdiction of the United States;

(3) Support the Secretary of the Treasury in developing plans to control the movement of property entering and leaving the United States;

(4) Support the heads of other Federal departments and agencies and State and local governments in developing programs and plans for identifying fatalities and reuniting families in national security emergencies;

(5) Support the intelligence community in the planning of its counterintelligence and counterterrorism programs.

PART 12—Department of Labor

Sec. 1201. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Labor shall:

(1) Develop plans and issue guidance to ensure effective use of civilian workforce resources during national security emergencies. Such plans shall include, but not necessarily be limited to:

(a) Priorities and allocations, recruitment, referral, training, employment stabilization including appeals procedures, use assessment, and determination of critical skill categories; and

(b) Programs for increasing the availability of critical workforce skills and occupations;

(2) In consultation with the Secretary of the Treasury, develop plans and procedures for wage, salary, and benefit costs stabilization during national security emergencies;

(3) Develop plans and procedures for protecting and providing incentives for the civilian labor force during national security emergencies;

(4) In consultation with other appropriate government agencies and private entities, develop plans and procedures for effective labor-management relations during national security emergencies.

Sec. 1202. Support Responsibilities. The Secretary of Labor shall:

(1) Support planning by the Secretary of Defense and the private sector for the provision of human resources to critical defense industries during national security emergencies;

(2) Support planning by the Secretary of Defense and the Director of Selective Service for the institution of conscription in national security emergencies.

PART 13—Department of State

Sec. 1301. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of State shall:

(1) Provide overall foreign policy coordination in the formulation and execution of continuity of government and other national security emergency preparedness activities that affect foreign relations;

(2) Prepare to carry out Department of State responsibilities in the conduct of the foreign relations of the United States during national security emergencies, under the direction of the President and in consultation with the heads of other appropriate Federal departments and agencies, including, but not limited to:

(a) Formulation and implementation of foreign policy and negotiation regarding contingency and post-emergency plans, intergovernmental agreements, and arrangements with United States' allies;

(b) Formulation, negotiation, and execution of policy affecting the relationships of the United States with neutral states;

- (c) Formulation and execution of political strategy toward hostile or enemy states;
- (d) Conduct of mutual assistance activities;
- (e) Provision of foreign assistance, including continuous supervision and general direction of authorized economic and military assistance programs;
- (f) Protection or evacuation of United States citizens and nationals abroad and safeguarding their property abroad, in consultation with the Secretaries of Defense and Health and Human Services;
- (g) Protection of international organizations and foreign diplomatic, consular, and other official personnel and property, or other assets, in the United States, in coordination with the Attorney General and the Secretary of the Treasury;
- (h) Formulation of policies and provisions for assistance to displaced persons and refugees abroad;
- (i) Maintenance of diplomatic and consular representation abroad; and
- (j) Reporting of and advising on conditions overseas that bear upon national security emergencies.

Sec. 1302. Support Responsibilities. The Secretary of State shall:

- (1) Assist appropriate agencies in developing planning assumptions concerning accessibility of foreign sources of supply;
- (2) Support the Secretary of the Treasury, in consultation, as appropriate, with the Secretaries of Commerce and Defense, in the formulation and execution of economic measures with respect to other nations;
- (3) Support the Secretary of Energy in international liaison activities pertaining to nuclear materials facilities;
- (4) Support the Director of the Federal Emergency Management Agency in the coordination and integration of United States policy regarding the formulation and implementation of civil emergency resources and preparedness planning;
- (5) Assist the Attorney General of the United States in the formulation of national security emergency plans for the control of persons entering or leaving the United States.

PART 14—Department of Transportation

Sec. 1401. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of Transportation shall:

- (1) Develop plans to promulgate and manage overall national policies, programs, procedures, and systems to meet essential civil and military transportation needs in national security emergencies;
- (2) Be prepared to provide direction to all modes of civil transportation in national security emergencies, including air, surface, water, pipelines, and public storage and warehousing, to the extent such responsibility is vested in the Secretary of Transportation. This direction may include:
 - (a) Implementation of priorities for all transportation resource requirements for service, equipment, facilities, and systems;
 - (b) Allocation of transportation resource capacity; and
 - (c) Emergency management and control of civil transportation resources and systems, including privately owned automobiles, urban mass transit, intermodal transportation systems, the National Railroad Passenger Corporation and the St. Lawrence Seaway Development Corporation;
- (3) Develop plans to provide for the smooth transition of the Coast Guard as a service to the Department of the Navy during national security emergencies. These plans shall be compatible with the Department of Defense planning systems, especially in the areas of port security and military readiness;

(4) In coordination with the Secretary of State and the Director of the Federal Emergency Management Agency, represent the United States in transportation-related international (including NATO and allied) civil emergency preparedness planning and related activities;

(5) Coordinate with State and local highway agencies in the management of all Federal, State, city, local, and other highways, roads, streets, bridges, tunnels, and publicly owned highway maintenance equipment to assure efficient and safe use of road space during national security emergencies;

(6) Develop plans and procedures in consultation with appropriate agency officials for maritime and port safety, law enforcement, and security over, upon, and under the high seas and waters subject to the jurisdiction of the United States to assure operational readiness for national security emergency functions;

(7) Develop plans for the emergency operation of U.S. ports and facilities, use of shipping resources (U.S. and others), provision of government war risks insurance, and emergency construction of merchant ships for military and civil use;

(8) Develop plans for emergency management and control of the National Airspace System, including provision of war risk insurance and for transfer of the Federal Aviation Administration, in the event of war, to the Department of Defense;

(9) Coordinate the Interstate Commerce Commission's development of plans and preparedness programs for the reduction of vulnerability, maintenance, restoration, and operation of privately owned railroads, motor carriers, inland waterway transportation systems, and public storage facilities and services in national security emergencies.

Sec. 1402. Support Responsibility. The Secretary of Transportation shall coordinate with the Secretary of Energy in the planning and management of transportation resources involved in the bulk movement of energy materials.

PART 15—Department of the Treasury

Sec. 1501. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Secretary of the Treasury shall:

(1) Develop plans to maintain stable economic conditions and a market economy during national security emergencies; emphasize measures to minimize inflation and disruptions; and, minimize reliance on direct controls of the monetary, credit, and financial systems. These plans will include provisions for:

(a) Increasing capabilities to minimize economic dislocations by carrying out appropriate fiscal, monetary, and regulatory policies and reducing susceptibility to manipulated economic pressures;

(b) Providing the Federal Government with efficient and equitable financing sources and payment mechanisms;

(c) Providing fiscal authorities with adequate legal authority to meet resource requirements;

(d) Developing, in consultation with the Board of Governors of the Federal Reserve System, and in cooperation with the Board of Directors of the Federal Deposit Insurance Corporation, the Federal Home Loan Bank Board, the National Credit Union Administration Board, the Farm Credit Administration Board and other financial institutions, plans for the continued or resumed operation and liquidity of banks, savings and loans, credit unions, and farm credit institutions, measures for the reestablishment of evidence of assets or liabilities, and provisions for currency withdrawals and deposit insurance;

(2) Provide for the protection of United States financial resources including currency and coin production and redemption facilities, Federal check disbursement facilities, and precious monetary metals;

- (3) Provide for the preservation of, and facilitate emergency operations of, public and private financial institution systems, and provide for their restoration during or after national security emergencies;
- (4) Provide, in coordination with the Secretary of State, for participation in bilateral and multilateral financial arrangements with foreign governments;
- (5) Maintain the Federal Government accounting and financial reporting system in national security emergencies;
- (6) Develop plans to protect the President, the Vice President, other officers in the order of presidential succession, and other persons designated by the President;
- (7) Develop plans for restoration of the economy following an attack; for the development of emergency monetary, credit, and Federal benefit payment programs of those Federal departments and agencies that have responsibilities dependent on the policies or capabilities of the Department of the Treasury; and for the implementation of national policy on sharing war losses;
- (8) Develop plans for initiating tax changes, waiving regulations, and, in conjunction with the Secretary of Commerce or other guaranteeing agency, granting or guaranteeing loans for the expansion of industrial capacity, the development of technological processes, or the production or acquisition of essential materials;
- (9) Develop plans, in coordination with the heads of other appropriate Federal departments and agencies, to acquire emergency imports, make foreign barter arrangements, or otherwise provide for essential material from foreign sources using, as appropriate, the resources of the Export-Import Bank or resources available to the Bank;
- (10) Develop plans for encouraging capital inflow and discouraging the flight of capital from the United States and, in coordination with the Secretary of State, for the seizure and administration of assets of enemy aliens during national security emergencies;
- (11) Develop plans, in consultation with the heads of appropriate Federal departments and agencies, to regulate financial and commercial transactions with other countries;
- (12) Develop plans, in coordination with the Secretary of Commerce and the Attorney General of the United States, to control the movement of property entering or leaving the United States;
- (13) Cooperate and consult with the Chairman of the Securities and Exchange Commission, the Chairman of the Federal Reserve Board, the Chairman of the Commodities Futures Trading Commission in the development of emergency financial control plans and regulations for trading of stocks and commodities, and in the development of plans for the maintenance and restoration of stable and orderly markets;
- (14) Develop plans, in coordination with the Secretary of State, for the formulation and execution of economic measures with respect to other nations in national security emergencies.

Sec. 1502. Support Responsibilities. The Secretary of the Treasury shall:

- (1) Cooperate with the Attorney General of the United States on law enforcement activities, including the control of people entering and leaving the United States;
- (2) Support the Secretary of Labor in developing plans and procedures for wage, salary, and benefit costs stabilization;
- (3) Support the Secretary of State in plans for the protection of international organizations and foreign diplomatic, consular, and other official personnel and property or other assets in the United States.

PART 16—Environmental Protection Agency

Sec. 1601. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Administrator of the Environmental Protection Agency shall:

- (1) Develop Federal plans and foster development of State and local plans designed to prevent or minimize the ecological impact of hazardous agents (biological, chemical, or radiological) introduced into the environment in national security emergencies;
- (2) Develop, for national security emergencies, guidance on acceptable emergency levels of nuclear radiation, assist in determining acceptable emergency levels of biological agents, and help to provide detection and identification of chemical agents;
- (3) Develop, in coordination with the Secretary of Defense, plans to assure the provision of potable water supplies to meet community needs under national security emergency conditions, including claimancy for materials and equipment for public water systems.

Sec. 1602. *Support Responsibilities.* The Administrator of the Environmental Protection Agency shall:

- (1) Assist the heads of other Federal agencies that are responsible for developing plans for the detection, reporting, assessment, protection against, and reduction of effects of hazardous agents introduced into the environment;
- (2) Advise the heads of Federal departments and agencies regarding procedures for assuring compliance with environmental restrictions and for expeditious review of requests for essential waivers.

PART 17—Federal Emergency Management Agency

Sec. 1701. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Director of the Federal Emergency Management Agency shall:

- (1) Coordinate and support the initiation, development, and implementation of national security emergency preparedness programs and plans among Federal departments and agencies;
- (2) Coordinate the development and implementation of plans for the operation and continuity of essential domestic emergency functions of the Federal Government during national security emergencies;
- (3) Coordinate the development of plans, in cooperation with the Secretary of Defense, for mutual civil-military support during national security emergencies;
- (4) Guide and assist State and local governments and private sector organizations in achieving preparedness for national security emergencies, including development of plans and procedures for assuring continuity of government, and support planning for prompt and coordinated Federal assistance to States and localities in responding to national security emergencies;
- ✓ (5) Provide the President a periodic assessment of Federal, State, and local capabilities to respond to national security emergencies;
- (6) Coordinate the implementation of policies and programs for efficient mobilization of Federal, State, local, and private sector resources in response to national security emergencies;
- (7) Develop and coordinate with all appropriate agencies civil defense programs to enhance Federal, State, local, and private sector capabilities for national security emergency crisis management, population protection, and recovery in the event of an attack on the United States;
- (8) Develop and support public information, education and training programs to assist Federal, State, and local government and private sector entities in planning for and implementing national security emergency preparedness programs;

(9) Coordinate among the heads of Federal, State, and local agencies the planning, conduct, and evaluation of national security emergency exercises;

(10) With the assistance of the heads of other appropriate Federal departments and agencies, develop and maintain capabilities to assess actual attack damage and residual recovery capabilities as well as capabilities to estimate the effects of potential attacks on the Nation;

(11) Provide guidance to the heads of Federal departments and agencies on the appropriate use of defense production authorities, including resource claimancy, in order to improve the capability of industry and infrastructure systems to meet national security emergency needs;

(12) Assist the Secretary of State in coordinating the formulation and implementation of United States policy for NATO and other allied civil emergency planning, including the provision of:

(a) advice and assistance to the departments and agencies in alliance civil emergency planning matters;

(b) support to the United States Mission to NATO in the conduct of day-to-day civil emergency planning activities; and

(c) support facilities for NATO Civil Wartime Agencies in cooperation with the Departments of Agriculture, Commerce, Energy, State, and Transportation.

Sec. 1702. Support Responsibilities. The Director of the Federal Emergency Management Agency shall:

(1) Support the heads of other Federal departments and agencies in preparing plans and programs to discharge their national security emergency preparedness responsibilities, including, but not limited to, such programs as mobilization preparedness, continuity of government planning, and continuance of industry and infrastructure functions essential to national security;

(2) Support the Secretary of Energy, the Secretary of Defense, and the Members of the Nuclear Regulatory Commission in developing plans and capabilities for identifying, analyzing, mitigating, and responding to emergencies related to nuclear weapons, materials, and devices, including mobile and fixed nuclear facilities, by providing, inter alia, off-site coordination;

(3) Support the Administrator of General Services in efforts to promote a government-wide program with respect to Federal buildings and installations to minimize the effects of attack and establish shelter management organizations.

PART 18—General Services Administration

Sec. 1801. Lead Responsibilities. In addition to the applicable responsibilities covered in Parts 1 and 2, the Administrator of General Services shall:

(1) Develop national security emergency plans and procedures for the operation, maintenance, and protection of federally owned and occupied buildings managed by the General Services Administration, and for the construction, alteration, and repair of such buildings;

(2) Develop national security emergency operating procedures for the control, acquisition, leasing, assignment, and priority of occupancy of real property by the Federal Government, and by State and local governments acting as agents of the Federal Government, except for the military facilities and facilities with special nuclear materials within the jurisdiction of the Departments of Defense and Energy;

(3) Develop national security emergency operational plans and procedures for the use of public utility services (other than telecommunications services) by Federal departments and agencies, except for Department of Energy-operated facilities;

(4) Develop plans and operating procedures of government-wide supply programs to meet the requirements of Federal departments and agencies during national security emergencies;

(5) Develop plans and operating procedures for the use, in national security emergencies, of excess and surplus real and personal property by Federal, State, and local governmental entities;

(6) Develop plans, in coordination with the Director of the Federal Emergency Management Agency, with respect to Federal buildings and installations, to minimize the effects of attack and establish shelter management organizations.

Sec. 1802. *Support Responsibility.* The Administrator of General Services shall develop plans to assist Federal departments and agencies in operation and maintenance of essential automated information processing facilities during national security emergencies.

PART 19—National Aeronautics and Space Administration

Sec. 1901. *Lead Responsibility.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Administrator of the National Aeronautics and Space Administration shall coordinate with the Secretary of Defense to prepare for the use, maintenance, and development of technologically advanced aerospace and aeronautical-related systems, equipment, and methodologies applicable to national security emergencies.

PART 20—National Archives and Records Administration

Sec. 2001. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Archivist of the United States shall:

(1) Develop procedures for publication during national security emergencies of the Federal Register for as broad public dissemination as is practicable of presidential proclamations and Executive orders, Federal administrative regulations, Federal emergency notices and actions, and Acts of Congress;

(2) Develop emergency procedures for providing instructions and advice on the handling and preservation of records critical to the operation of the Federal Government in national security emergencies.

PART 21—Nuclear Regulatory Commission

Sec. 2101. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Members of the Nuclear Regulatory Commission shall:

(1) Promote the development and maintenance of national security emergency preparedness programs through security and safeguards programs by licensed facilities and activities;

(2) Develop plans to suspend any licenses granted by the Commission; to order the operations of any facility licensed under Section 103 or 104; Atomic Energy Act of 1954, as amended (42 U.S.C. 2133 or 2134); to order the entry into any plant or facility in order to recapture special nuclear material as determined under Subsection (3) below; and operate such facilities;

(3) Recapture or authorize recapture of special nuclear materials from licensees where necessary to assure the use, preservation, or safeguarding of such materials for the common defense and security, as determined by the Commission or as requested by the Secretary of Energy.

Sec. 2102. *Support Responsibilities.* The Members of the Nuclear Regulatory Commission shall:

(1) Assist the Secretary of Energy in assessing damage to Commission-licensed facilities, identifying useable facilities, and estimating the time and actions necessary to restart inoperative facilities;

(2) Provide advice and technical assistance to Federal, State, and local officials and private sector organizations regarding radiation hazards and protective actions in national security emergencies.

PART 22—Office of Personnel Management

Sec. 2201. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Director of the Office of Personnel Management shall:

(1) Prepare plans to administer the Federal civilian personnel system in national security emergencies, including plans and procedures for the rapid mobilization and reduction of an emergency Federal workforce;

(2) Develop national security emergency work force policies for Federal civilian personnel;

(3) Develop plans to accommodate the surge of Federal personnel security background and pre-employment investigations during national security emergencies.

Sec. 2202. *Support Responsibilities.* The Director of the Office of Personnel Management shall:

(1) Assist the heads of other Federal departments and agencies with personnel management and staffing in national security emergencies, including facilitating transfers between agencies of employees with critical skills;

(2) In consultation with the Secretary of Defense and the Director of Selective Service, develop plans and procedures for a system to control any conscription of Federal civilian employees during national security emergencies.

PART 23—Selective Service System

Sec. 2301. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Director of Selective Service shall:

(1) Develop plans to provide by induction, as authorized by law, personnel that would be required by the armed forces during national security emergencies;

(2) Develop plans for implementing an alternative service program.

PART 24—Tennessee Valley Authority

Sec. 2401. *Lead Responsibility.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Board of Directors of the Tennessee Valley Authority shall develop plans and maintain river control operations for the prevention or control of floods affecting the Tennessee River System during national security emergencies.

Sec. 2402. *Support Responsibilities.* The Board of Directors of the Tennessee Valley Authority shall:

(1) Assist the Secretary of Energy in the development of plans for the integration of the Tennessee Valley Authority power system into nationwide national security emergency programs;

(2) Assist the Secretaries of Defense, Interior, and Transportation and the Chairman of the Interstate Commerce Commission in the development of plans for operation and maintenance of inland waterway transportation in the Tennessee River System during national security emergencies.

PART 25—United States Information Agency

Sec. 2501. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Director of the United States Information Agency shall:

(1) Plan for the implementation of information programs to promote an understanding abroad of the status of national security emergencies within the United States;

(2) In coordination with the Secretary of State's exercise of telecommunications functions affecting United States diplomatic missions and consular offices overseas, maintain the capability to provide television and simultaneous direct radio broadcasting in major languages to all areas of the world, and the capability to provide wireless file to all United States embassies during national security emergencies.

Sec. 2502. *Support Responsibility.* The Director of the United States Information Agency shall assist the heads of other Federal departments and agencies in planning for the use of media resources and foreign public information programs during national security emergencies.

PART 26—United States Postal Service

Sec. 2601. *Lead Responsibility.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Postmaster General shall prepare plans and programs to provide essential postal services during national security emergencies.

Sec. 2602. *Support Responsibilities.* The Postmaster General shall:

- (1) Develop plans to assist the Attorney General of the United States in the registration of nationals of enemy countries residing in the United States;
- (2) Develop plans to assist the Secretary of Health and Human Services in registering displaced persons and families;
- (3) Develop plans to assist the heads of other Federal departments and agencies in locating and leasing privately owned property for Federal use during national security emergencies.

PART 27—Veterans' Administration

Sec. 2701. *Lead Responsibilities.* In addition to the applicable responsibilities covered in Parts 1 and 2, the Administrator of Veterans' Affairs shall:

- (1) Develop plans for provision of emergency health care services to veteran beneficiaries in Veterans' Administration medical facilities, to active duty military personnel and, as resources permit, to civilians in communities affected by national security emergencies;
- (2) Develop plans for mortuary services for eligible veterans, and advise on methods for interment of the dead during national security emergencies.

Sec. 2702. *Support Responsibilities.* The Administrator of Veterans' Affairs shall:

- (1) Assist the Secretary of Health and Human Services in promoting the development of State and local plans for the provision of medical services in national security emergencies, and develop appropriate plans to support such State and local plans;
- (2) Assist the Secretary of Health and Human Services in developing national plans to mobilize the health care industry and medical resources during national security emergencies;
- (3) Assist the Secretary of Health and Human Services in developing national plans to set priorities and allocate medical resources among civilian and military claimants.

PART 28—Office of Management and Budget

Sec. 2801. In addition to the applicable responsibilities covered in Parts 1 and 2, the Director of the Office of Management and Budget shall prepare plans and programs to maintain its functions during national security emergencies. In connection with these functions, the Director of the Office of Management and Budget shall:

- (1) Develop plans to ensure the preparation, clearance, and coordination of proposed Executive orders and proclamations;

(2) Prepare plans to ensure the preparation, supervision, and control of the budget and the formulation of the fiscal program of the Government;

(3) Develop plans to coordinate and communicate Executive branch views to the Congress regarding legislation and testimony by Executive branch officials;

(4) Develop plans for keeping the President informed of the activities of government agencies, continuing the Office of Management and Budget's management functions, and maintaining presidential supervision and direction with respect to legislation and regulations in national security emergencies.

PART 29—General

Sec. 2901. Executive Order Nos. 10421 and 11490, as amended, are hereby revoked. This Order shall be effective immediately.

THE WHITE HOUSE,
November 18, 1988.

Ronald Reagan

[FR Doc. 88-27194

Filed 11-21-88; 1:08 pm]

Billing code 6718-21-M

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01. Report	Conventional Weapons (10 pp.)	2/90	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: O'Neil, John F., Files
Subseries: Reports and Publications Files
WHORM Cat.:
File Location: Biological Warfare [3 of 4]

Date Closed: 6/1/2010	OA/ID Number: 62104-006
FOIA/SYS Case #: 2005-0336-F	Appeal Case #:
Re-review Case #:	Appeal Disposition:
P-2/P-5 Review Case #:	Disposition Date:
AR Case #:	MR Case #:
AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
 P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
 P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
 P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
 P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
 (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
 (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
 (b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
 (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
 (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
02. Presentation	Technical Requirements and Limitations of Biological Weapons (30 pp.)		(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: O'Neil, John F., Files
Subseries: Reports and Publications Files
WHORM Cat.:
File Location: Biological Warfare [3 of 4]

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AR Disposition:	MR Disposition:
AR Disposition Date:	MR Disposition Date:

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Soviet Biological Warfare Threat



Defense Intelligence Agency

DST-1610F-057-86
1986

This document represents the Defense Intelligence Agency's continuing effort to respond to requests from members of Congress, the Armed Forces and the public for unclassified information on the Soviet Union's biological warfare (BW)¹ capabilities.

The illustrations in this document are derived from various U.S. sources; while not revealing of every detail, they are authentic.

The United States Government has not recognized the incorporation of Estonia, Latvia and Lithuania into the Soviet Union. Other boundary representations on the maps are not necessarily authoritative.

Cover Illustration:

Soviet helicopters, such as the Mi-24/HINDs depicted, are capable of disseminating aerosols of biological warfare agents.

¹ This booklet focuses on the threat from Soviet disease agents developed for BW purposes and does not elaborate the threat from Soviet toxin weapons

Soviet Biological Warfare Threat

*This is a Department of Defense Intelligence Document
Prepared by the Defense Intelligence Agency*

Soviet maintenance of an offensive biological warfare program and capability, as well as their involvement in the production and transfer of toxins to surrogates in Southeast Asia, are in violation of the Biological and Toxin Weapons Convention. Their use of chemical and toxic substances for hostile purposes in Southeast Asia and Afghanistan is a violation of The 1925 Geneva Protocol. For details see:

- U.S. Department of State Special Report No. 98 — *Chemical Warfare in Southeast Asia and Afghanistan*, March 22, 1982.
- U.S. Department of State Special Report No. 104 — *Chemical Warfare in Southeast Asia and Afghanistan: An Update*, November 1982.

DST-1610F-057-86
1986

Soviet Biological Warfare Threat

FOREWORD

It is the purpose of this booklet to provide a better understanding of the nature of biological weapons and the impact of evolving technologies on the development of biological warfare (BW). The nature of disease research, wherein research for peaceful or military purposes is virtually indistinguishable, makes it extremely difficult to identify non-compliance with the Biological and Toxin Weapons Convention of 1972. For example — virulence, infective dose, aerosol behavior, immunizing characteristics and production economy studies that are done for medical, biological and public health research are also relevant to developing a disease agent for warfare purposes.

Some infectious disease and toxin research and development can always give rise to ambiguities and suspicions. However, the major accident that occurred in the Soviet Union in the city of Sverdlovsk in April 1979 raised concerns that anthrax agent was under investigation at a level beyond what is allowed by the Biological and Toxin Weapons Convention. Indeed, Soviet BW-related activities since World War II lead us to conclude that they have developed and produced biological and toxin agents and the associated hardware for use as BW weapons.

In recent years, we have become increasingly concerned that this genre of weaponry will be developed by some nations including those of the Third World. We are gravely concerned that we will see BW programs underway in some countries within five years and limited production within a decade.

We have also provided a number of appendices for background information. These include the peaceful and weapons implications of biotechnology, the complete texts and listings of signatory nations for the Biological and Toxin Weapons Convention of 1972 and the Geneva Protocol of 1925, and descriptions of how BW agents and munitions can be safely destroyed.


LEONARD H. PERROOTS
Lieutenant General, USAF
Director

Soviet Biological Warfare Threat

KEY JUDGMENTS

The Biological and Toxin Weapons Convention of 1972 prohibits the development, production and stockpiling of biological and toxin weapons. In effect, the Geneva Protocol of 1925 prohibits the first use of chemical and bacteriological weapons in war. (See appendices for the complete texts of the Convention and Protocol.) We believe that the Soviets have gone far beyond what is allowed by these treaties for the following reasons:

- The size and scope of their efforts are not consistent with any reasonable standard of what could be justified on the basis of prophylactic, protective or peaceful purposes.
- The Soviets continue to evaluate the military utility of biological and toxin weapons.
- The Soviets are rapidly incorporating biotechnological developments into their offensive BW program to improve agent utility on the tactical battlefield.

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Soviet Biological Warfare Threat

The Soviet Biological Warfare Capability

The Soviet offensive BW program has been monitored by the U.S. for decades. When the Biological and Toxin Weapons Convention (BWC) of 1972 went into force in 1975, the issue became one of whether or not the Soviets were in compliance. Although the BWC bans the development, production and stockpiling of biological agents and toxins for hostile purposes, we have observed no reduction in Soviet offensive BW activity. We have concluded that the Soviets have and are developing and producing BW agents. They are continuing to test and evaluate delivery and dissemination systems for these agents.

Scientific personnel at a number of Soviet microbiological research institutes are capable of performing research and development (R&D) with highly infectious disease agents and very potent plant, animal and microbial toxins. Likewise there is considerable Soviet work in aerobiology, cloud physics, airborne infections, and disease agent stabilization which has direct application to BW. Much of the knowledge and technical expertise at these institutes is funded and utilized by the Soviet Ministry of Defense for offensive BW as well as for defensive/protective aspects.

We also have identified a number of installations capable of producing disease agents and toxins on a large-scale and placing them in muni-



Location of the candidate BW test and evaluation installation on Vozrozhdeniya Island in the Aral Sea.

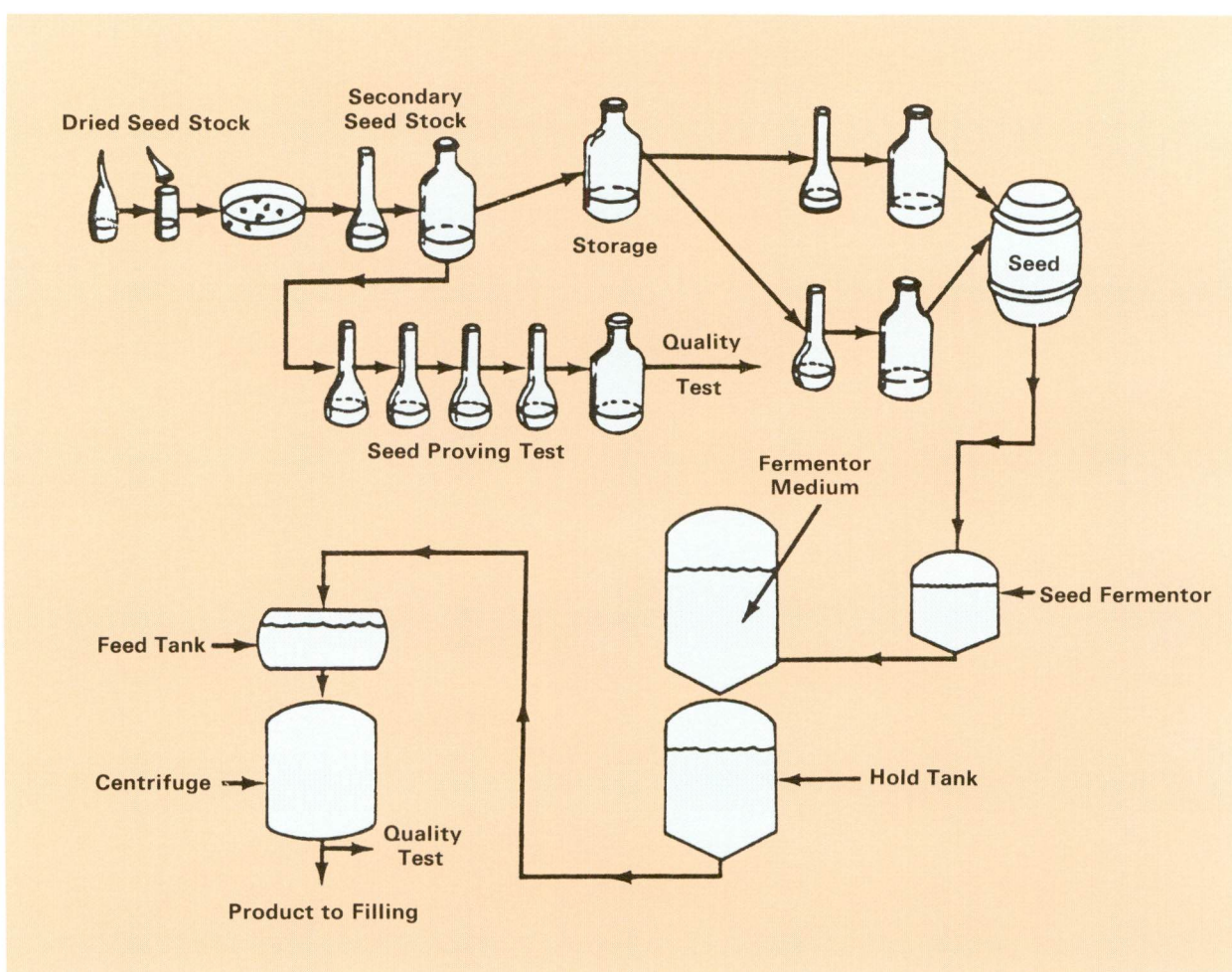
tions and delivery/dissemination systems. These installations have been established by the Ministry of Defense and are under its control. One such facility is in the city of Sverdlovsk and has a long history of biological warfare R&D and production with emphasis on the causative agent of anthrax. In addition to anthrax, we believe the Soviets have developed tularemia, plague and cholera for BW purposes, as well as botulinum toxin, enterotoxin, and mycotoxins.

Biological Warfare Agent Production

The production of large quantities of disease agents by the Soviets for BW purposes can be accomplished by various fermentation processes. In a strict sense industrial fermentation processes are concerned with the products produced by multiplying microorganisms. However, a fer-

mentation process can also be used to produce large numbers of microorganisms which themselves become the desired end-product. Thus, an infectious agent grown in large numbers and then placed in a weapon/dissemination system becomes a BW weapon. Production of a toxin agent is usually accomplished using fermentation processes except that the toxin produced by the microorganisms during the growth process is the end-product rather than the microorganism itself. A viral or rickettsial agent, unlike a bacterial agent, requires living metabolizing animal cells for growth, thereby requiring large-scale use of embryonated eggs or tissue cell culture systems to produce quantities of viruses or rickettsia for BW weapons.

Shown is an illustration of a batch fermentation system for bacterial agents which depicts the pro-



A production system for bacterial disease agents.

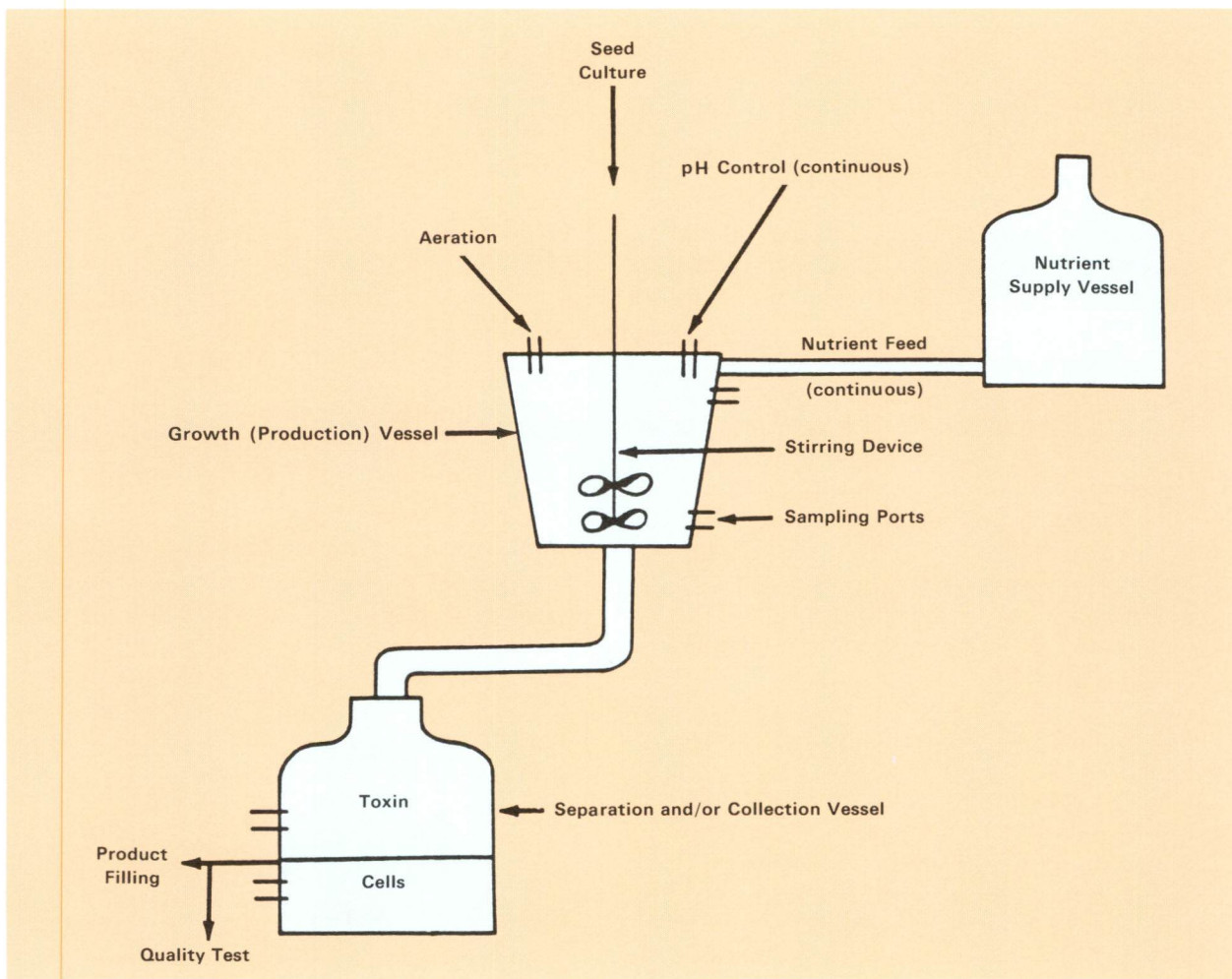
cess from starter, or seed culture, to end-product for use in munitions or other dissemination devices. Continuous fermentation can also be used for BW agent production. The anthrax agent can be produced from start to finish in 96 hours since bacteria have the ability to multiply very quickly as illustrated in the table. Both systems can be computer controlled.

During the growth cycle of anthrax, the microorganism is in the shape of a rod, its vegetative form. Towards the end of its growth cycle, it can be made to convert into spores by heat or chemical shock. It is the spores that are harvested and placed into delivery/dissemination devices. The spores are very resistant to heat, disinfectants, sunlight and other environmental factors. When the spores are inhaled, they convert again to the vegetative form, establish an infection, and

as they multiply in the host, produce a highly lethal toxin. Anthrax causes a high mortality rate when the infection results from ingestion (up to 70 percent fatal) or inhalation (almost 100

Number of hours	Number of bacteria
0	1
1	8
2	64
3	512
4	4,096
5	32,768
6	262,144
7	2,097,152
8	16,777,216
9	134,000,000
10	1,072,000,000

The multiplication of the bacterium, Escherichia coli, under ideal growth conditions. Many bacteria have generation times like those of E. coli. One can readily see the heavy concentration of bacteria that will result during growth cycles in liquid cultures. New computerized systems are increasing these concentrations of bacteria per unit volume.



A continuous production system for bacterial disease agents.

percent fatal) if treatment is not begun promptly. Although anthrax bacteria are penicillin sensitive, successful treatment of the disease depends upon killing the microorganisms before a lethal concentration of anthrax toxin is produced. The skin form of infection can also be lethal if it invades the bloodstream and therapy is not started quickly. In addition to penicillin, other antibiotics are effective.

Anthrax spores can be disseminated in either a liquid or dry form. Although highly resistant in the environment, they can be killed with strong disinfectants or high temperature. Anthrax is a non-contagious agent. The number of anthrax spores required to kill 50 percent of exposed individuals (lethal dose 50 or LD50) is between 8,000 and 10,000. Even though such high concentrations of anthrax are required to be delivered over a target population, the Soviets have no technical difficulties in achieving this. Having produced BW agents they must also be concerned with their destruction. See Appendix D.

The Sverdlovsk Biological Warfare Facility: The Events of 1979

During early April 1979, an accidental release of anthrax occurred in Sverdlovsk that caused many casualties and most probably a very high death rate among Soviet citizens who were exposed. The Soviet Government at that time admitted only to some public health problems, which it said were caused by the illegal sale of anthrax-contaminated meat. They have never acknowledged the existence of the Sverdlovsk facility and, of course, have never revealed the nature of the work conducted there. The U.S. Government has requested an explanation of what happened in Sverdlovsk on numerous occasions but the Soviets persist in blaming contaminated meat for the anthrax epidemic.

Our analysis shows that the following events occurred:

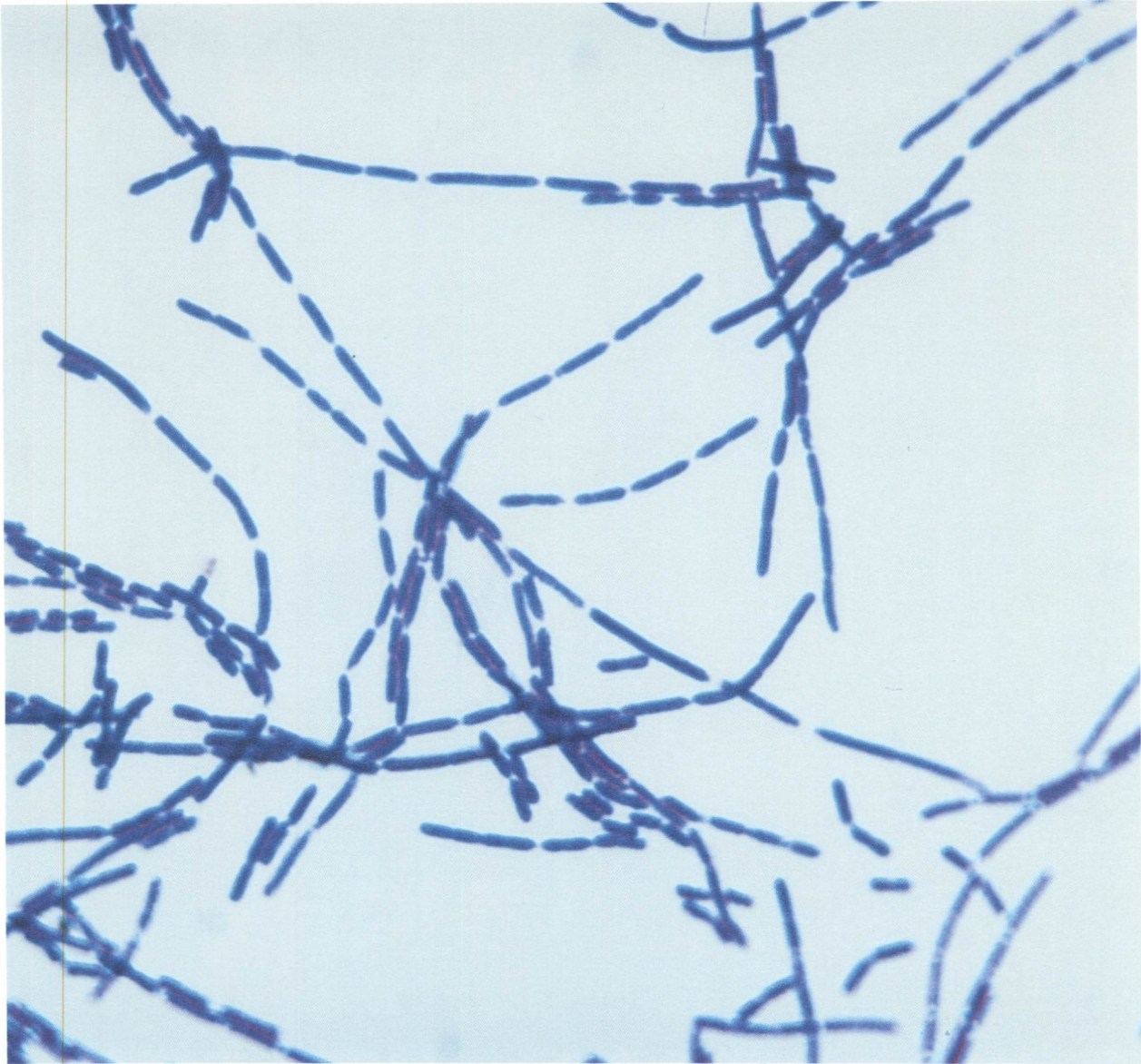
- Early in April 1979, an accidental release of anthrax occurred within the Microbiology and Virology Institute in Sverdlovsk City. The Institute is a military facility located in the southwestern outskirts of the city. While

	Accident Potential	Aerosol Release
Lab Operations	Low-Medium	mg-g
Pilot Plant Scale	Low-High	g-KG
Production	Medium-High	50g-300 KG
Training	Medium	up to 5KG
Testing	High	up to 100g
Storage	Low	up to 100KG
Waste Handling/ Decontamination	Low	g

Each of the various operations involved in the production of anthrax has the potential for releasing aerosols in quantities indicated (one thousandth of a gram to 300 kilograms). The scale of operations, whether the agent is in liquid or dry form, and whether the operations involve high pressure, volatile solvents, or explosives also affects the potential for aerosol release. It is difficult to aerosolize more than 10% of wet anthrax spores. It is relatively easy to aerosolize almost 100% of anthrax spores in dry form. These factors plus other information were critical in our analysis of the Sverdlovsk accident.

bulk quantities of anthrax spores in dry form were probably being prepared, a pressurized system probably exploded.

- As much as 22 pounds (10 kg) of dry anthrax spores were released from the Institute.
- The bacterial aerosol contaminated an area with a radius of at least 2-3 miles.
- Within two weeks, which is within the time frame expected for the disease to develop, a significant number of deaths occurred.
- Residents and workers within the contaminated area contracted pulmonary anthrax through inhalation. In addition it is possible that some may have contracted anthrax by skin contact and, over time, a number may have contracted anthrax by consumption of food contaminated by the fall-out of spores.
- Initial disinfection and decontamination procedures were largely ineffective.
- Mass immunizations with the Soviet anthrax vaccine were partially effective at best.



An 18-hour culture of anthrax.

- Vaccinations and antibiotic treatment were administered too late as an initial response.
- Containment procedures were effective in confining the problem to the southwest area of Sverdlovsk City.
- Strict censorship as to the true nature of the incident served to neutralize early panic and limit the fears of the Sverdlovsk population.
- Containment procedures continued into July 1979. Some inspection procedures were conducted until the Fall of 1979.

In summary:

- A major outbreak of anthrax occurred at a closed military installation.
- The Soviets have persisted in claiming that a routine outbreak of anthrax among animals caused intestinal anthrax among people who consumed the bad meat.
- The extraordinary efforts to "clean-up" are inconsistent with the Soviet explanation.
- It has been reported that hundreds of Soviet citizens died from inhalation anthrax within

seven to ten days of the outbreak despite heroic attempts by Soviet doctors to save their lives.

- It has also been reported that in subsequent weeks there may have been 1,000 or more cases. These figures are about 100 or more times the annual incidence of inhalation and intestinal anthrax throughout the USSR in recent years.¹
- Heavy military involvement and early military casualties immediately after the accident,

total military control within two weeks, plus roof top spraying of decontaminating solutions from aircraft are not consistent with public health control measures for dealing with anthrax acquired by eating bad meat.

- The reported aerial spraying activity and disinfection with steam and hypochlorite solution around the military facility are clear attempts to decontaminate surfaces affected by an infectious aerosol.



Accidental release of anthrax from Biological Warfare Facility at Sverdlovsk.

¹ In the USSR the usual incidence of clinical anthrax in humans has been approximately 95 percent cutaneous (skin), 2.4 percent intestinal, 1.2 percent inhalation, and 1.4 percent other forms. Based on Soviet data, the estimated total number of cases in the USSR during 1978 was about 700 for all forms of anthrax. This translates to seventeen expected intestinal cases and eight expected inhalation cases. The 1978 incidence of anthrax is similar to that for the period 1965-78.

- Collectively, these events are a very strong contradiction of the Soviet position which claimed the anthrax outbreak was just a public health problem resulting from the sale of contaminated meat.

The Soviet Biological Warfare Organization

Regular Soviet Chemical Troops of the Ministry of Defense are involved in BW activities. Despite the name Chemical Troops, this force is responsible for ensuring that Soviet units can operate under any type of contaminated battlefield including nuclear, biological and chemical (NBC). This force has some 45,000 officers and soldiers in the ground forces alone in peacetime. They man special NBC reconnaissance and decontamination units which are part of ground force formations at all levels from regiment to *front*. Similar units exist in the other branches of service.

The responsibilities of the Chemical Troops include oversight of:

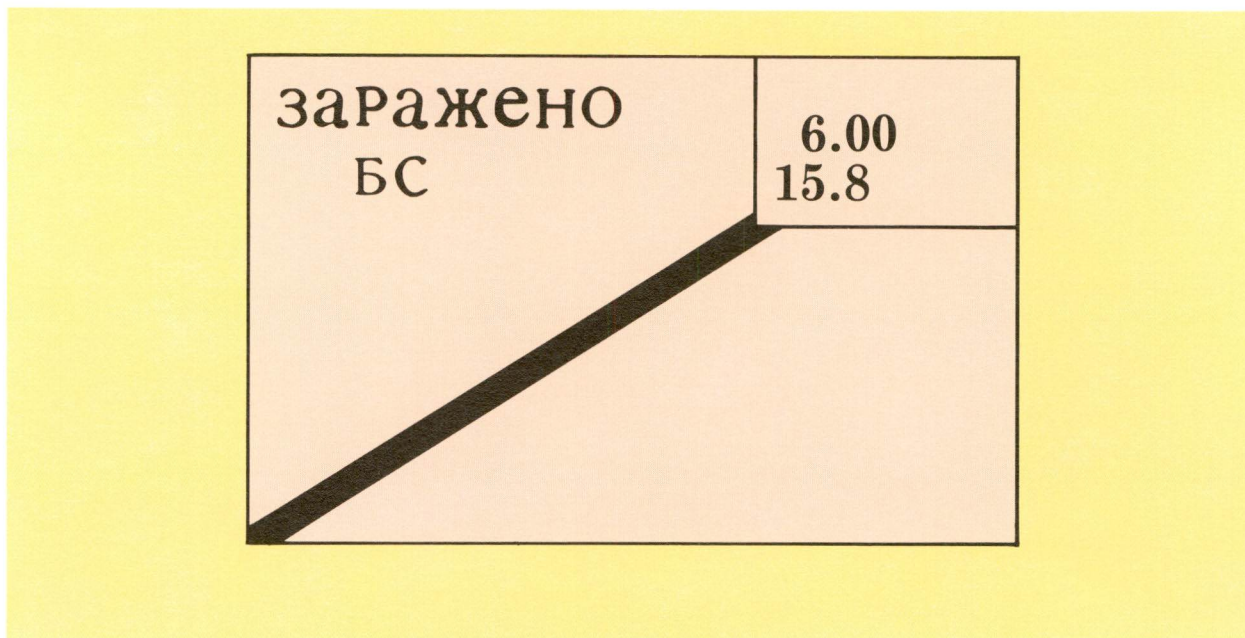
- Development of biological and chemical weapons.
- Testing and evaluation of BW and chemical warfare (CW) agents and delivery/dissemination systems.
- Weaponizing and storage of BW and CW agents.
- Technical advice to combat commanders regarding the use of and effectiveness of biological weapons.
- R&D, production and storage of protective gear.
- Training of all forces for survival on a battlefield contaminated with BW agents.
- Reconnaissance and decontamination.
- Operating the Chemical Academies (college equivalent).



New Soviet Chemical, Biological, Radiological Protective Mask.

The specialists of the Chemical Troops have over 30,000 vehicles specifically designed for NBC reconnaissance and decontamination of personnel and equipment. Special training areas exist for training units of the Chemical Troops. Additionally, most modern Soviet vehicles have collective protection systems designed to protect against NBC contamination.

The Soviets have vaccines or antidotes for many of the diseases that they might use in a BW attack. These include those for anthrax, tularemia, plague, and botulism. Immunization is essential for those personnel who produce, handle, and deliver BW agents and weapons as well as those who would move into an area where BW agents had been disseminated. Standard Soviet protective suits and masks, together with sanitary and disease control measures, would be sufficient to protect most Soviet soldiers from the effects of their BW agents.



BW warning flag and marker for identifying terrain contaminated by disease agents and toxins.

Biotechnology and the Soviet Union

The Soviet Union has been combating and controlling disease epidemics for many years. As a result, they have developed expertise in biomedical research, identifying the foci of infections and controlling diseases. They have made significant contributions to the literature on infectious diseases and have had an impact in the international arena on public health matters. Their knowledge of the behavior of bacteria, viruses and rickettsia is voluminous and has been used primarily to address domestic and international problems of disease control.

The Soviets also have had a long-standing interest in industrial biotechnology which dates back to World War II. During the siege of Leningrad single-cell protein (SCP) derived from wood shavings was used as food. Since that time, the Soviet SCP industry has grown to be the largest in the world with over a million tons produced annually and used for livestock fodder. It is estimated that one ton of SCP frees up about six tons of feed grain that otherwise would have to be imported and paid for in hard currency. The Soviets are also dependent upon their microbiological industry to

produce vitamins, antibiotics, vaccines and advanced diagnostics and therapeutics for legitimate use in their military and civilian populations.

The Soviets now recognize the potential of modern biotechnology and genetic engineering particularly since the Soviet Union has a greater need for advancements in agriculture and public health than the West. As such, the Soviets made the development of a biotechnological industry a top priority in 1974 and reaffirmed their commitment in 1981. Since that time, they have made remarkable progress in developing their biotechnological capabilities.

Unfortunately, these same technologies are being used by the Ministry of Defense to develop new and more effective BW agents. With this biotechnological capability, naturally-occurring microorganisms can be made more virulent, antibiotic-resistant, and manipulated to render current U.S. vaccines ineffective. Such developments would greatly complicate our ability to detect and identify BW agents, and to operate in areas contaminated by the Soviets with such biological agents. See Appendix A for a comprehensive review of the various aspects of biotechnology.

APPENDIX A

BIOTECHNOLOGY: PAST, PRESENT AND FUTURE

BIOTECHNOLOGY

Introduction

Biotechnology is a very broad field which involves many disciplines within science and industry. Currently basic sciences such as genetics, molecular biology, chemistry, biochemistry, microbiology, immunology, pharmacology, and toxicology are primarily used for the research and development of products. Primary emphasis is being directed towards diagnostic and therapeutic aids for medicine. In both the short- and long-term, more scientific disciplines such as engineering, agriculture, computer technology, animal husbandry, structural technology and geology will become participants in the worldwide biotechnological effort. The potential of biotechnology for the benefit of both the developed and lesser developed areas of the world is tremendous. Unfortunately, the Soviets are not only taking advantage of the beneficial aspects but are simultaneously exploiting biotechnology for the development of new biological warfare agents.

History of Biotechnology

Biotechnology is not a new field of science. In one way or another humans have practiced biotechnology from the time wine was first made, foods were preserved, and plants were domesticated and selected for their biggest and best crops. This early type of biotechnology occurred by chance. One can imagine the surprise experienced by the first person who waited too long to drink grape juice which had unknowingly been fermented to wine by yeast. The same wine, if stored even longer, became vinegar due to bacteria which converted the alcohol to acetic acid. Through the centuries, chance occurrences and

need, accompanied by common sense, developed into industries which have given mankind foods, such as wine, beer and cheese; the pickling process and other types of food preservation; many agricultural plants; and numerous antibiotics and drugs.

The discovery of penicillin by Fleming in 1929 was by chance. A spore of the fungus, *Penicillium notatum*, contaminated a petri dish containing the bacterium, *Staphylococcus aureus*, which is a human pathogen (disease causing). Fleming noticed that *Staphylococcus aureus* did not grow in the vicinity of where the fungus was growing. Fleming correctly interpreted this to mean that the fungus was producing something which inhibited bacterial growth. This compound was penicillin which is now known to interfere with cell wall synthesis and thereby kill the bacteria. The amount of penicillin produced by Fleming's strain of *Penicillium*, however, was very small. It took many years of experimentation and selection before high yields of the antibiotic could be produced on an industrial scale. Fortunately, large amounts of penicillin were available during World War II and many thousands of lives were saved. Following the discovery of penicillin, many more antibiotics have been and still are being discovered but in an organized fashion. It's important to keep in mind that at the time of Fleming's discovery microbiology was still in its infancy. How microbial cells operated was poorly understood even though it was recognized that microbes could be devastating when they caused disease, but beneficial when they produced foods or antibiotics. Genetics at this time was studied but the exact nature of the genetic material of cells was still being debated.

Genetics: The Foundation of Biotechnology

In 1944 the genetic material of all cells was shown to be DNA (deoxyribonucleic acid). It took almost ten more years for Watson and Crick to determine the double helical structure of DNA which contains the genetic code. Since that time, there has been an explosion in knowledge which has developed into the field of molecular genetics. It has been found that there are only four bases (adenine, thymine, guanine and cytosine) in DNA, and that these bases make up nucleotides when attached to a sugar (ribose) and phosphate groups. The sequence of nucleotides makes up genes, and genes make up chromosomes.

In the double-stranded DNA molecule, adenine always pairs up with thymine and guanine with cytosine. A spiral staircase is a good way of envisioning the structure of DNA. The boards on either side of the steps would represent the sugar-phosphate backbone, whereas the steps would be analogous to the bases (one from each side) pairing at the mid-point of the steps. It is the sequence of the nucleotides in DNA which determines if an organism is plant, animal or microbial. A typical microbial cell, for example, contains about 3,000 genes comprised of some 3 million nucleotides, whereas a human cell has around 30,000 genes and 3 billion nucleotides. The enzymatic machinery of all cells permits the DNA to be transcribed into RNA (ribonucleic acid) which in turn is translated into proteins. Proteins either become structural components of a cell or enzymes. The enzymes are responsible for millions of chemical reactions in cells which enable them to grow and to multiply.

Modern Biotechnology

Modern biotechnology is distinguished from early biotechnology by the degree to which genes can now be identified and manipulated. The roots of modern biotechnology date back only to 1973 when, for the first time, a gene was removed from the DNA of one type of cell and spliced into the DNA of another type of cell. This procedure has come to be known as recombinant DNA technology, or genetic engineering, which

is graphically shown. Although a large number of technological breakthroughs was necessary to achieve what is shown in the graphic, one of the more notable was the discovery of classes of enzymes called restriction endonucleases and ligases. Restriction endonucleases permit researchers to "cut" DNA chemically at very precise locations, whereas ligases allow pieces of DNA to be rejoined chemically. The former may be thought of as "chemical scissors" and the latter, a "glue".

The identification of plasmids was yet another important discovery since these relatively small, circular pieces of DNA found naturally in many microbial cells can be recombined with genes isolated from either plants, animals or other microbial cells. They can then be introduced into microbial cells which function as biological factories for the product coded for by the gene. When plasmids contain a foreign gene and are used to transfer the gene to a foreign organism, they are called vectors. Plasmids containing foreign genes are not always inserted into microbes. They can be introduced into plant and animal cells as well.

In addition to the above molecular tools, scientists now have sophisticated instruments available for determining the nucleotide sequences of genes and the ability to synthesize genes. These instruments in a matter of days permit genetic manipulations which ten years ago took months or even years to accomplish.

Within the past several years, the field of protein engineering has emerged. In the future it will be an essential component of biotechnology. The goal here is to design proteins, such as enzymes, which are improvements over what nature has to offer. Computer simulations are and will be ever more helpful to scientists in predicting what can be achieved by changing the sequence of amino acids, the building blocks of proteins. One such enzyme is subtilisin which is used in laundry detergents.

A discussion of modern biotechnology would not be complete without mention of monoclonal

antibodies. They are produced by first immunizing an animal with an antigen, and then recovering and identifying certain white blood cells, called B-lymphocytes, which produce antibody to a single antigen. The antibody-producing lymphocytes are physically fused with cancer cells giving a hybridoma cell. The hybridoma obtains the ability to produce antibody to only one type of antigen from the lymphocyte, whereas the cancer cell gives the hybridoma immortality in tissue culture. Monoclonal antibodies can be recovered in good yield and with relative ease from the culture medium of the hybridomas.

Global Biotechnology: Who will benefit?

There is a considerable commercial Free World biotechnological effort which is being matched by universities and government research institutes. Even though biotechnology will have a great impact upon many sectors within the West and Japan, lesser developed countries along with the Soviet Union and China have the most to gain in agriculture and public health. The Soviets and Chinese recognize this and are developing governmental-directed biotechnology programs.

The Commercialization and Future of Biotechnology

Currently there are about 1800 biotechnology companies in the Free World. Most are concentrated in the U.S., Canada, Western Europe and Japan. Research is primarily directed toward developing new and better methods of diagnosing and treating disease. Considerable effort is also being devoted to: generating fuels from biomass; producing single-cell protein for livestock; developing better plants for agriculture; synthesizing chemicals on an industrial scale; treating domestic and industrial waste; creating new structural materials; recovering strategic minerals; and the development of biosensors. Some companies are even looking to the 21st century and the realization of biomolecular electronic devices. In the future, there will be significant advances in all areas of industry mentioned resulting in a

bioindustry with projected worldwide sales of 100 billion dollars by the turn of the century.

Within the next decade, medicine will be revolutionized by a host of new products and technologies. In addition to immunotoxins, other anticancer drugs and immune system modifiers will be available to treat cancer and other diseases. Products acquired by genetic engineering will be developed for treating cardiovascular disease and will permit physicians to dissolve blood clots, treat high blood pressure better, and reduce the probability of stroke and heart attack in high risk groups.

Certain rare genetic-deficiency diseases will be treatable as well. Frequently such diseases result from the inability of an individual to produce a single enzyme. Bone marrow cells will be removed; the gene coding for the missing enzyme introduced into the cells which, when returned to the patient, will proliferate and produce the lacking enzyme and cure the patient.

Monoclonal antibodies have been used extensively in research and are currently being used in a variety of ways for diagnosing diseases. Others will follow and eventually permit "medicine cabinet" diagnosis of some diseases.

Yet another emerging area for medicine involves the creation of DNA probes through genetic manipulation. Small, unique pieces of DNA from disease-causing microbes are identified, synthesized and labelled either with radioactive compounds or fluorescent dyes. These probes are very specific for a particular microorganism, have the ability to bind with DNA of the microbe, and thereby detect very quickly and accurately small numbers of microorganisms in clinical specimens from patients. This in turn will significantly aid physicians in providing more rapid and better health care.

Human insulin and human growth hormone are already available commercially for treating diabetes and dwarfism, respectively. Both of these

compounds were obtained through genetic engineering. Other therapeutics such as interferon, interleukin, tumor necrosis factor, and tissue plasminogen activator are in various stages of development and clinical testing.

Additionally, any number of new and better vaccines for presently uncontrollable diseases can be expected in the years to come. One of the most promising, which has been developed through genetic engineering, is for malaria which affects hundreds of millions of people worldwide.

Yet another area of concentrated research is the combined use of monoclonal antibodies and anticancer drugs resulting in immunotoxins which hold the promise of treating different types of cancer. In this case, monoclonal antibody produced against cancer antigen on the surface of cancer cells is attached to an anticancer drug. When introduced into a patient, immunotoxins attach only to cancer cells and kill them. Although still in the R&D phase, one such immunotoxin has been created by attaching monoclonal antibodies to ricin, an extremely potent toxin, produced by the castor bean plant. Yet other immunotoxins have been synthesized using standard anticancer drugs and are in clinical testing.

New materials ranging from light weight, super-strong structural products to bioplastics, bioadhesives, and biolubricants will appear on the market. This will enable a variety of industries to improve significantly their current products and expand their product lines.

One area in which biotechnology will have its most profound affect is in agriculture. Plants will be made more tolerant to heat, pollution, arid conditions, and temperature which will permit areas of the world to be cultivated where previously impossible. New fuels will be produced from agricultural biomass which is now considered waste and will help to conserve petroleum resources. The burdensome process of creating

hybrid strains of crops will be made faster, more economical and selective. This area will experience some of the most rapid advancement. Some crops have already been genetically engineered to be herbicide-resistant and are being evaluated. This will enable farmers to control weeds more efficiently, thereby making some foods more affordable. Plants will be engineered to grow more quickly for areas with short growing seasons. Tolerance to drought will not only increase the total cultivable land but help insulate farmers from unpredictable and devastating droughts. As a result of these and many more advances, the world's food supply will be cheaper, larger and more consistent. Lesser developed countries, now importers of food, will become self-sufficient. More and improved food supplies, combined with better and more widespread health care, will hopefully in the long-run be stabilizing factors in the world.

Biological Warfare Applications

For military purposes, biotechnology has opened up a large number of possibilities. Normally harmless, non-disease producing microorganisms can be modified to become highly toxic or produce diseases for which an opponent has no known treatment or vaccine. Other disease agents now considered too unstable for storage or warfare applications can be modified using genetic engineering to be effective BW agents.

As advances in biotechnology are made, the potential for applying them to BW increases significantly. The development of agents having optimal weapons potential is facilitated; basic research-to-mass production of agents is accelerated; and distinguishing between peaceful research, development and production and its application for BW purposes becomes more difficult. Finally, we believe smaller nations are going to opt for the BW weapon as they acquire biotechnological capabilities.

APPENDIX B

GENEVA PROTOCOL OF 1925

Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare

Signed at Geneva June 17, 1925

Entered into force February 8, 1928

Ratification advised by the U.S. Senate December 16, 1974

Ratified by U.S. President January 22, 1975

U.S. ratification deposited with the Government of France April 10, 1975

Proclaimed by U.S. President April 29, 1975

The Undersigned Plenipotentiaries, in the name of their respective Governments:

Whereas the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices, has been justly condemned by the general opinion of the civilized world; and

Whereas the prohibition of such use has been declared in Treaties to which the majority of Powers of the World are Parties; and

To the end that this prohibition shall be universally accepted as part of International Law, binding alike the conscience and the practice of nations;

Declare:

That the High Contracting Parties, so far as they are not already Parties to Treaties prohibiting such use, accept this prohibition, agree to extend this prohibition to the use of bacteriological methods of warfare and agree to be bound as between themselves according to the terms of this declaration.

The High Contracting Parties will exert every

effort to induce other States to accede to the present Protocol. Such accession will be notified to the Government of the French Republic, and by the latter to all signatory and acceding Powers, and will take effect on the date of the notification by the Government of the French Republic.

The ratifications of the present Protocol shall be addressed to the Government of the French Republic, which will at once notify the deposit of such ratification to each of the signatory and acceding Powers.

The instruments of ratification of and accession to the present Protocol will remain deposited in the archives of the Government of the French Republic.

The present Protocol will come into force for each signatory Power as from the date of deposit of its ratification, and, from that moment, each Power will be bound as regards other powers which have already deposited their ratifications.

IN WITNESS WHEREOF the Plenipotentiaries have signed the present Protocol.

DONE at Geneva in a single copy, this seventeenth day of June, One Thousand Nine Hundred and Twenty-Five.

GENEVA PROTOCOL

States Parties to the Protocol for the Prohibition of the use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, Done at Geneva June 17, 1925

States which have deposited instruments of ratification or accession, or continue to be bound as the result of succession agreements concluded by them or by reason of notification given by them to the Secretary-General of the United Nations:

1 a b	Argentina-May 12, 1969	1 a b	Greece-May 30, 1931
	Australia-Jan. 22, 1930	1 a b	Grenada
	Austria-May 9, 1928	1 a b 2	Guyana
1 a b 2	Bahamas, The		Holy See-Oct. 18, 1966
2	Barbados-June 22, 1976		Hungary-Oct. 11, 1952
1 a b	Belgium-Dec. 4, 1928		Iceland-Nov. 2, 1967
6	Bhutan-June 12, 1978 ⁶	1 a b	India-Apr. 9, 1930
1 a b 2	Botswana		Indonesia-Jan. 26, 1971
	Brazil-Aug. 28, 1970		Iran-July 4, 1929
1 a b	Bulgaria-Mar. 7, 1934	1 a b	Iraq-Sept. 8, 1931
1 a b 2	Burma		Ireland-Aug. 18, 1930
1 a b	Canada-May 6, 1930	1 a b	Israel-Feb. 20, 1969
	Central African Republic-July 31, 1970		Italy-Apr. 3, 1928
1 a b	Chile-July 2, 1935		Ivory Coast-July 27, 1970
1 a b	China, People's Republic of-Aug. 9, 1952		Jamaica-July 31, 1970
	China (Taiwan)-Aug. 7, 1929		Japan-May 21, 1970
7	Comoros	1 a b d	Jordan-Jan. 20, 1977
	Cuba-June 24, 1966		Kenya-July 6, 1970
	Cyprus-Dec. 12, 1966	1 a b d	Kuwait-Dec. 15, 1971
1 b	Czechoslovakia-Aug. 16, 1938		Latvia-June 3, 1931
	Denmark-May 5, 1930		Lebanon-Apr. 17, 1969
7	Djibouti		Lesotho-Mar. 15, 1972
	Dominican Republic-Dec. 8, 1970		Liberia-Apr. 2, 1927
	Ecuador-Sept. 16, 1970	1 b d	Libya-Dec. 29, 1971
	Egypt-Dec. 6, 1928		Lithuania-June 15, 1933
1 a b	Estonia-Aug. 28, 1931		Luxembourg-Sept. 1, 1936
	Ethiopia-Sept. 18, 1935		Madagascar-Aug. 12, 1967
1 a b	Fiji-Mar. 21, 1973		Malawi-Sept. 14, 1970
	Finland-June 26, 1929		Malaysia-Dec. 10, 1970
1 a b 3	France-May 9, 1926		Maldives Islands-Jan. 16, 1967
	Gambia, The-Nov. 16, 1966		Mali-Nov. 19, 1966
	German Democratic Republic		Malta-Oct. 15, 1970
	Germany, Federal Republic of-		Mauritius-Jan. 8, 1971
	Apr. 25, 1929		Mexico-Mar. 15, 1932
	Ghana-May 3, 1967		Monaco-Jan. 6, 1967

1 b	Mongolia-Dec. 6, 1968	1 c 4	Suriname
	Morocco-Oct. 13, 1970	1 a b 2	Swaziland
	Nepal-May 9, 1969		Sweden-Apr. 25, 1930
1 c 4	Netherlands-Oct. 31, 1930		Switzerland-July 12, 1932
1 a b	New Zealand-Jan. 22, 1930	1 d	Syrian Arab Republic-Dec. 17, 1968
	Niger-Apr. 19, 1967		Tanzania-Apr. 22, 1963
1 a b	Nigeria-Oct. 15, 1968		Thailand-June 6, 1931
	Norway-July 27, 1932		Togo-Apr. 5, 1971
	Pakistan-June 9, 1960		Tonga-July 28, 1971
	Panama-Dec. 4, 1970		Trinidad and Tobago-Nov. 30, 1970
1 a b	Papua New Guinea-Sept. 16, 1975		Tunisia-July 12, 1967
	Paraguay-Jan. 14, 1969		Turkey-Oct. 5 1929
	Philippines-May 29, 1973		Uganda-May 24, 1965
	Poland-Feb. 4, 1929	1 a b	Union of Soviet Socialist Republics-
1 a b	Portugal-July 1, 1930		Apr. 5, 1928
	Qatar-Sept. 16, 1976	1 a b 5	United Kingdom-Apr. 9, 1930
	Romania-Aug. 23, 1929	1 c	United States-Apr. 10, 1975
1 a b	Rwanda-June 25, 1964		Upper Volta-Apr. 12, 1977
	Saudi Arabia-Jan. 27, 1971		Uruguay-Apr. 12, 1977
1 a b 2	Seychelles		Venezuela-Feb. 8, 1928
	Sierra Leone-Mar. 20, 1967	1 a b	Vietnam-Sept. 23. 1980
1 a b 2	Singapore	1 b	Yemen Arab Republic (Sana)-
1 a b	South Africa-Jan. 22, 1930		Mar. 17, 1971
1 a b	Spain-Aug. 22, 1929		Yugoslavia-Apr. 12, 1929
	Sri Lanka-Jan. 20, 1954	1 a b 2	Zambia
	Sudan-Dec. 17, 1980		

1 a, b, c, d With reservations to Protocol as follows:

a—binding only as regards relations with other parties.

b—to cease to be binding in regard to any enemy States whose armed forces or allies do not observe provisions.

c—to cease to be binding as regards use of chemical agents with respect to any enemy State whose armed forces or allies do not observe provisions.

d—does not constitute recognition of or involve treaty relations with Israel.

2 By virtue of agreement with former parent State or notification to the Secretary General of the United Nations of succession to treaty rights and obligations upon independence.

3 Applicable to all French territories.

4 Applicable to Suriname and Curacao.

5 It does not bind India or any British Dominion which is a separate member of the League of Nations and does not separately sign or adhere to the Protocol. It is applicable to all colonies.

6 Deposited accession on June 12, 1978, but the French Government asked that accession take effect on date of notification by them—Feb. 19, 1979.

7 Included in declaration by France. Continued application has apparently not been determined.

APPENDIX C
THE BIOLOGICAL AND TOXIN WEAPONS CONVENTION OF 1972

Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction

Signed at Washington, London, and Moscow April 10, 1972

Ratification advised by U.S. Senate December 16, 1974

Ratified by U.S. President January 22, 1975

U.S. ratification deposited at Washington, London, and Moscow March 26, 1975

Proclaimed by U.S. President March 26, 1975 Entered into force March 26, 1975

The States Parties to this Convention,

Determined to act with a view to achieving effective progress towards general and complete disarmament, including the prohibition and elimination of all types of weapons of mass destruction, and convinced that the prohibition of the development, production and stockpiling of chemical and bacteriological (biological) weapons and their elimination, through effective measures, will facilitate the achievement of general and complete disarmament under strict and effective international control,

Recognizing the important significance of the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, signed at Geneva on June 17, 1925, and conscious also of the contribution which the said Protocol has already made, and continues to make, to mitigating the horrors of war,

Reaffirming their adherence to the principles and objectives of that Protocol and calling upon all States to comply strictly with them,

Recalling that the General Assembly of the United Nations has repeatedly condemned all actions contrary to the principles and objectives of the Geneva Protocol of June 17, 1925,

Desiring to contribute to the strengthening of confidence between peoples and the general improvement of the international atmosphere,

Desiring also to contribute to the realization of the purposes and principles of the Charter of the United Nations,

Convinced of the importance and urgency of eliminating from the arsenals of States, through effective measures, such dangerous weapons of mass destruction as those using chemical or bacteriological (biological) agents,

Recognizing that an agreement on the prohibition of bacteriological (biological) and toxin weapons represents a first possible step towards the achievement of agreement on effective measures also for the prohibition of the development, production and stockpiling of chemical weapons, and determined to continue negotiations to that end,

Determined, for the sake of all mankind, to exclude completely the possibility of bacteriological (biological) agents and toxins being used as weapons, Convinced that such use would be repugnant to the conscience of mankind and that no effort should be spared to minimize this risk,

Have agreed as follows:

Article I

Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

(1) Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;

(2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Article II

Each State Party to this Convention undertakes to destroy, or to divert to peaceful purposes, as soon as possible but not later than nine months after the entry into force of the Convention, all agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, which are in its possession or under its jurisdiction or control. In implementing the provisions of this article all necessary safety precautions shall be observed to protect populations and the environment.

Article III

Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment or means of delivery specified in article I of the Convention.

Article IV

Each State Party to this Convention shall, in accordance with its constitutional processes, take any necessary measures to prohibit and prevent

the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere.

Article V

The States to this Convention undertake to consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention. Consultation and cooperation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

Article VI

(1) Any State Party to this Convention which finds that any other State Party is acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all possible evidence confirming its validity, as well as a request for its consideration by the Security Council.

(2) Each State Party to this Convention undertakes to cooperate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties to the Convention of the results of the investigation.

Article VII

Each State Party to this Convention undertakes to provide or support assistance, in accordance with the United Nations Charter, to any Party to the Convention which so requests, if the Security Council decides that such Party has been exposed to danger as a result of violation of the Convention.

Article VIII

Nothing in this Convention shall be interpreted as in any way lessening or detracting from the obligations assumed by any State under the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, signed at Geneva on June 17, 1925.

Article IX

Each State Party to this Convention affirms the recognized objective of effective prohibition of chemical weapons and, to this end, undertakes to continue negotiations in good faith with a view to reaching early agreement on effective measures for the prohibition of their development, production and stockpiling and for their destruction, and on appropriate measures concerning equipment and means of delivery specifically designed for the production or use of chemical agents for weapons purposes.

Article X

(1) The States Parties to this Convention undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes. Parties to the Convention in a position to do so shall also cooperate in contributing individually or together with other States or international organizations to the further development and application of scientific discoveries in the field of bacteriology (biology) for prevention of disease, or for other peaceful purposes.

(2) This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development of States Parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities, including the international exchange of bacteriological (biological) agents

and toxins and equipment for the processing, use or production of bacteriological (biological) agents and toxins for peaceful purposes in accordance with the provisions of the Convention.

Article XI

Any State Party may propose amendments to this Convention. Amendments shall enter into force for each State Party accepting the amendments upon their acceptance by a majority of the States Parties to the Convention and thereafter for each remaining State Party on the date of acceptance by it.

Article XII

Five years after the entry into force of this Convention, or earlier if it is requested by a majority of Parties to the Convention by submitting a proposal to this effect to the Depositary Governments, a conference of States Parties to the Convention shall be held at Geneva, Switzerland, to review the operation of the Convention, with a view to assuring that the purposes of the preamble and the provisions of the Convention, including the provisions concerning negotiations on chemical weapons, are being realized. Such review shall take into account any new scientific and technological developments relevant to the Convention.

Article XIII

(1) This Convention shall be of unlimited duration.

(2) Each State Party to this Convention shall in exercising its national sovereignty have the right to withdraw from the Convention if it decides that extraordinary events, related to the subject matter of the Convention, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other States Parties to the Convention and to the United Nations Security Council three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interests.

Article XIV

(1) This Convention shall be open to all States for signature. Any State which does not sign the Convention before its entry into force in accordance with paragraph (3) of this Article may accede to it at any time.

(2) This Convention shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the United States of America, the United Kingdom of Great Britain and Northern Ireland and the Union of Soviet Socialist Republics, which are hereby designated the Depositary Governments.

(3) This Convention shall enter into force after the deposit of instruments of ratification by twenty-two Governments, including the Governments designated as Depositaries of the Convention.

(4) For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Convention, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

(5) The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification or of accession and the date of the entry into force of this Convention, and of the receipt of other notices.

(6) This Convention shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

Article XV

This Convention, the English, Russian, French, Spanish and Chinese texts of which are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of the Convention shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding states.

IN WITNESS WHEREOF the undersigned, duly authorized, have signed this Convention.

DONE in triplicate, at the cities of Washington, London and Moscow, this tenth day of April, one thousand nine hundred and seventy-two.

Country	Date of ¹ Signature	Date of Deposit ¹ of Ratification	Date of Deposit ¹ of Accession
Afghanistan	4/10/72	3/26/75	
Argentina	8/01/72	11/27/79	
Australia	4/10/72	10/05/77	
Austria	4/10/72	8/10/73	
Barbados	2/16/73	2/16/73	
Belgium	4/10/72	3/15/79	
Benin	4/10/72	4/25/75	
Bhutan		6/08/78	
Bolivia	4/10/72	10/30/75	
Botswana	4/10/72		
Brazil	4/10/72	2/27/73	
Bulgaria	4/10/72	8/02/72	
Burma	4/10/72		
Burundi	4/10/72		
Byelorussian S.S.R. ²	4/10/72	3/26/75	

Country	Date of Signature	Date of Deposit ¹ of Ratification	Date of Deposit ¹ of Accession
Cambodia (Kampuchea)	4/10/72	3/09/83	
Canada	4/10/72	9/18/72	
Cape Verde			10/20/77
Central African Republic	4/10/72		
Chile	4/10/72		
China, Peoples Republic of			10/15/84
China (Taiwan)	4/10/72	2/9/73	
Colombia	4/10/72	12/19/83	
Congo, People's Republic of (Brazzaville)			10/23/78
Costa Rica	4/10/72	12/17/73	
Cuba	4/12/72	4/21/76	
Cyprus	4/10/72	11/06/73	
Czechoslovakia	4/10/72	4/30/73	
Denmark	4/10/72	3/01/73	
Dominican Republic	4/10/72	2/23/73	
Ecuador	6/14/72	3/12/75	
Egypt	4/10/72		
El Salvador	4/10/72		
Ethiopia	4/10/72	6/26/75	
France	10/15/84	10/15/84	
Fiji	2/22/73	9/04/73	
Finland	4/10/72	2/04/74	
Gabon	4/10/72		
Gambia, The	6/02/72		
German Democratic Republic	4/10/72	11/28/72	
Germany, Federal Republic	4/10/72	4/07/83	
Ghana	4/10/72	6/06/75	
Greece	4/10/72	12/10/75	
Guatemala	5/09/72	9/19/73	
Guinea-Bissau			8/20/76
Guyana	1/03/73		
Haiti	4/10/72		
Honduras	4/10/72	3/14/79	
Hungary	4/10/72	12/27/72	
Iceland	4/10/72	2/15/73	
India	1/15/73	7/15/74	
Indonesia	6/20/72		
Iran	4/10/72	8/22/73	
Iraq	5/11/72		
Ireland	4/10/72	10/27/72	
Italy	4/10/72	5/30/75	
Ivory Coast	5/23/72		

Country	Date of Signature	Date of Deposit ¹ of Ratification	Date of Deposit ¹ of Accession
Jamaica			8/13/75
Japan	4/10/72	6/04/82	6/18/82
Jordan	4/10/72	6/02/75	
Kenya			9/30/81
Korea, Republic of	4/10/72		
Kuwait	4/14/72	7/18/72	
Laos	4/10/72	3/20/73	
Lebanon	4/10/72	6/13/75	
Lesotho	4/10/72		
Liberia	4/10/72		
Libya			1/19/82
Luxembourg	4/10/72	3/23/76	
Madagascar	10/13/72		
Malawi	4/10/72		
Malaysia	4/10/72		
Mali	4/10/72		
Malta	9/11/72	4/07/75	
Mauritius	4/10/72	8/07/72	
Mexico	4/10/72	4/08/74	
Mongolia	4/10/72	9/05/72	
Morocco	5/02/72		
Nepal	4/10/72		
Netherlands	4/10/72	6/22/81	
New Zealand	4/10/72	12/13/72	
Nicaragua	4/10/72	8/07/75	
Niger	4/21/72	6/23/72	
Nigeria	7/03/72	7/03/73	
Norway	4/10/72	8/01/73	
Pakistan	4/10/72	9/25/74	
Panama	5/02/72	3/20/74	
Papua New Guinea			10/27/80
Paraguay			6/09/76
Peru	4/10/72	6/05/85	
Philippines	4/10/72	5/21/73	
Poland	4/10/72	1/25/73	
Portugal	6/29/72	5/15/75	
Qatar	11/14/72	4/17/75	
Romania	4/10/72	7/25/79	
Rwanda	4/10/72	5/20/75	
San Marino ^{1p}	9/12/72	3/11/75	
Sao Tome and Principe			8/24/79
Saudi Arabia	4/12/72	5/24/72	

Country	Date of Signature	Date of Deposit ¹ of Ratification	Date of Deposit ¹ of Accession
Senegal	4/10/72	3/26/75	
Sierra Leone	11/07/72	6/29/76	
Seychelles			10/24/79
Singapore	6/19/72	12/02/75	
Somalia	7/03/72		
South Africa	4/10/72	11/03/75	
Spain	4/10/72	6/20/79	
Sri Lanka	4/10/72		
Sweden	2/27/75	2/05/76	
Switzerland	4/10/72	5/04/76	
Syrian Arab Republic	4/14/72		
Tanzania	8/16/72		
Thailand	1/17/73	5/28/75	
Togo	4/10/72	11/10/76	
Tonga			9/30/81
Tunisia	4/10/72	5/18/73	
Turkey	4/10/72	11/5/74	
Ukrainian S.S.R. ²	4/10/72	3/26/75	
Union of Soviet Socialist Republics	4/10/72	3/26/75	
United Arab Emirates	9/28/72		
United Kingdom	4/10/72	3/26/75	
United States	4/10/72	3/26/75	
Uruguay			4/16/81
Venezuela	4/10/72	10/18/78	6/20/80
Yemen Arab Republic (Sana)	4/10/72		
Yemen, People's Democratic Republic of (Aden)	4/26/72	6/01/79	
Yugoslavia	4/10/72	10/25/73	
Zaire	4/10/72	9/16/75	
Total³	113	84	16

¹ Dates given are the earliest dates on which countries signed the agreements or deposited their ratifications or accessions-whether in Washington, London, Moscow, or New York. In the Case of a country that was a dependent territory which became a party through succession, the date given is the date on which the country gave notice that it would continue to be bound by the terms of the agreement.

² The United States regards the signature and ratification by the Byelorussian S.S.R. and the Ukrainian S.S.R. as already included under the signature and ratification of the Union of Soviet Socialist Republics.

³ This total does not include actions by the Byelorussian S.S.R. and the Ukrainian S.S.R. (See footnote 2.)

APPENDIX D

BIOLOGICAL WARFARE AGENT DESTRUCTION:

HOW WOULD THE SOVIETS DO IT?

BIOLOGICAL WARFARE AGENT DESTRUCTION

When, and if, Soviet BW agents are destroyed, universally applicable microbiological principles and methods would have to be followed to ensure safe handling and neutralization of the infectious agents. Physical (heat) and chemical (liquid and gas disinfectants) methods are available for killing microorganisms. Not all, however, are useful for large-scale operations involving human pathogens.

The method(s) of choice would be determined by the: (1) type of agent (such as bacterial or viral), (2) amount of agent, (3) type of packaging (munition/non-munition or bulk/small lot), (4) form of agent (dried or liquid), and (5) whether the agent is a human or non-human pathogen. The causative agent of anthrax, *Bacillus anthracis*, when dried and in spore-form, is one of the most difficult organisms to handle safely and destroy.

General guidelines indicating a possible Soviet mode(s) of destruction can be drawn from the U.S. program which resulted in the complete and safe disposal of our BW inventory in the early 1970's. Destruction of agents occurred on-site at four production/storage facilities by multi-step processes. The decontamination process began with transport of agent from on-site storage facilities to decontamination buildings, and ended with incorporation of sterilized agent into surface soil, burial at the disposal sites, or biodegradation in sewage treatment plants. Intervening steps relied primarily on sterilization by heat but included chemical disinfection and/or incineration depending on whether the agent was in liquid or dried powder form.

Prior to, during and after the sterilization process, agent viability was monitored to ensure complete killing. Regardless of the type of agents and their location of storage and destruction, all

plans were designed to ensure: (1) absolute safety of operating personnel and maximal protection of the environment, (2) strict accountability of all the agents, (3) acquisition of incontrovertible evidence for complete destruction and disposal of stocks, and (4) provision for independent observers to witness destruction.

Materials destroyed included:

- Liquid agents stored as frozen pellets
- Bulk dry materials
- Bulk stocks of toxins
- Biological munitions (filled and unfilled)

Destruction of agents took approximately twelve months. The presence of dried, bulk-stored spores in the U.S. inventory represented one of the most difficult of all bacteriological agents to destroy due to their innate resistance to heat and chemical disinfection. Nonetheless, the U.S. effort was successful.

The destruction process for both dry and liquid agents began by transportation in containment vehicles to decontamination buildings maintained under negative pressure and with absolute air filtration systems. Initially, the liquid and dry agents were handled differently since dry agents first had to be suspended in a liquid chemical disinfectant to minimize aerosolization and to enable contained pumping, as a slurry, to holding/sterilization tanks. Thereafter, all the agents were neutralized by three cycles of heating at 160°F for one hour, 280°F for three hours and 300°F for ten minutes.

Heating was the primary method of sterilization and had the advantages of being:

- Applicable to large scale operations
- Universally effective against all types of microorganisms
- Easily controllable
- Reasonably fast
- Available at production facilities

Although the U.S. tested other methods such as chemical digestion or burning the materials in their storage containers, neither was satisfactory. No practical alternatives to prolonged, cyclical heating were found to provide the exceptionally high degree of safety required and the ability to insure total destruction of the viable materials. Heating, therefore, could be found by the Soviets to be the best method for destroying their BW inventory. Such a method, which is capable of neutralizing anthrax spores, in all likelihood would be suitable for any other agents the Soviets have in their inventory with the exception of mycotoxins which would require more intense and prolonged neutralization.

An explosives deactivation furnace and smelter had to be installed in the munitions filling and assembly building. The munitions' charges and

components were incinerated in the furnace, whereas non-combustible components were smelted. Biological agents in the munitions were first removed and neutralized.

The BW agent containers were composed of both combustible and non-combustible materials. Plastic carboys and bags were either filled or covered with disinfectant, sterilized for three hours at 250°F and incinerated. Glass and metal containers were sterilized by two cycles of heating at 250°F for three hours.

All personnel involved in the decontamination process were highly trained and experienced in handling pathogenic microorganisms. The individuals were all protected by immunization and appropriate protective clothing. Disposal operations of agents used the same, or stricter controls, than were used during manufacture.

As previously noted we are confident that the Soviets would abide by basic antiseptic and disinfection principles applicable to all human, animal and plant pathogens. There is no question that they understand these principles based on their long history of combating infectious diseases, identifying foci of infection, and treating and controlling their spread. Any differences with U.S. methods would probably be in style and not substance.



Soviet Chemical Weapons Threat



1985

SOVIET CHEMICAL WEAPONS THREAT

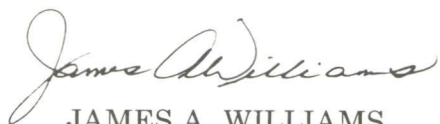
DST-1620F-051-85

This is a Department of Defense Intelligence Document
prepared by the Directorate for Scientific and Technical Intelligence
of the Defense Intelligence Agency.

This is an updated version of a document issued as a Department of Defense publication in October 1983. It represents our continuing efforts to respond to requests from members of Congress, the press and the Armed Forces for unclassified information on the Soviet Union's chemical warfare capabilities. The illustrations in this document are derived from various U.S. sources; while not revealing of every detail, they are authentic.

There is no question that the Soviets have long held a policy and doctrine that acknowledge the military utility of chemical weapons in warfare. This view persists today. Indeed, the Soviets are exploiting state-of-the-art technology for new or improved chemical warfare agents, with the obvious intent of extending their advantage over the West.

With respect to world-wide developments related to chemical warfare, we note that over the past 20 years, nations outside the NATO/Warsaw Pact spheres have shown strong interest in acquiring chemical warfare capabilities. In view of this trend, we have included a brief discussion on chemical weapons use and proliferation.

A handwritten signature in cursive script, reading "James A. Williams".

JAMES A. WILLIAMS
Lieutenant General, USA
Director

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KEY JUDGMENTS

- Although the Soviets have claimed they are pursuing only a defense against chemical weapons, the size and scope of their activities demonstrate a formidable capability to carry out offensive chemical operations. Soviet policy and doctrine promote the need for these types of weapons and their value in warfare.
- The Soviets recently have used chemical warfare agents and toxins in Afghanistan and have supplied them for use by client forces in Laos and Cambodia--actions that demonstrate Soviet willingness to exploit the military utility of chemical and toxin weapons.
- They have a wide range of chemical warfare agents and associated delivery/dissemination systems. The calculations for the offensive employment of chemical weapons have been established.
- Research, development, and testing are continuing.
- They can produce very large quantities of chemical warfare agents.
- Storage depots within the USSR have undergone a significant increase in storage capacity since the late 1960's.
- We believe chemical weapons are collocated with conventional weapons in forward areas facing NATO.
- A large force of military specialists and equipment give the Soviets an unmatched capability to survive and operate on a contaminated battlefield. All Soviet forces (land, sea and air) receive extensive training in chemical protection.
- Any military force fighting Soviet forces will run a substantial risk that the Soviets will use chemical weapons.

HISTORY

The Soviet Union's chemical weapons activities can be traced to World War I. Of all the belligerents fighting in that war, the Russians probably were the least prepared to conduct chemical warfare. The Germans first used chemical weapons against the Russians in January 1915, three months before these weapons were first used on the Western Front. Russian industry lacked the capability to produce significant quantities of chemical agent, their delivery means were primitive, and the chemical protection training of the individual Russian soldier was poor. As a consequence, the Russians incurred more chemical warfare casualties and deaths than any other nation. Of the approximately one half million Russian chemical casualties, more than 50,000 were deaths.

Because of the high losses suffered during World War I, the Soviet leadership began to stress the importance of chemical warfare. During the 1920's and 1930's, their industry was modernized, chemical agent plants were constructed, and research and development was undertaken on chemical weapons. A chemical warfare organization and military chemical academies were established, and preparedness for chemical warfare was stressed throughout their forces.

By World War II, the Soviets had an extensive chemical organization and a significant stockpile of chemical weapons. At the end of the war, the Soviets captured and relocated to the Soviet Union two German nerve agent production plants and stocks of chemical agent. During the 1950's, Soviet chemical institutes developed other nerve agents for use in chemical weapons. Since World War II the Soviet chemical warfare program has continued unabated.

Historical Aspects

- Russia suffered almost half a million chemical warfare casualties during World War I.
- First military chemical academies established in the 1920's.
- At the end of World War II the Soviets captured and relocated two nerve agent plants to the Soviet Union.

CHEMICAL WARFARE AGENTS

Soviet research and development activities, usually headed by military chemists, continue to explore new chemical agents and combinations including ways to render the protective masks, suits and filtration systems of potential enemies ineffective.

A number of chemical agents, toxins, and combinations have been used by the Soviets in Afghanistan and by their client forces in Southeast Asia (Laos and Cambodia). One group of agents has been positively identified in the laboratory: toxic substances (known as mycotoxins) produced by molds. Other agents remain unidentified.

Soviet Chemical Warfare Agents

Lethal Agents

Nerve agents (including sarin, soman, and a V-series agent)
Blister agents (including mustard, lewisite, and a mixture of the two)
Blood agent (hydrogen cyanide)
Choking agent (phosgene)

Incapacitants

Not specifically identified, but an agent which causes unconsciousness for an hour or more has been widely reported as being used in Afghanistan.

Toxins

Research and development of a variety of toxins is continuing.

Notes

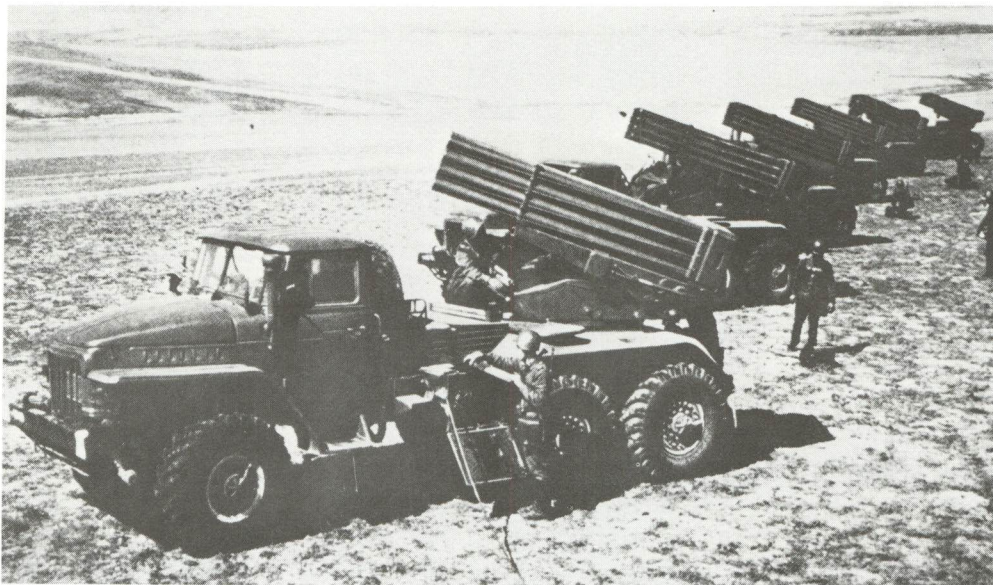
1. Protection from all of the above agents requires protective clothing and/or masks as well as rapid treatment for any exposed individuals.
2. Both non-persistent and persistent agents are available. Non-persistent agents will clear the target relatively quickly, while persistent agents will stay on target for hours to days, depending on weather conditions, unless removed by decontamination.
3. We believe the Soviets are investigating binary systems for chemical agent delivery because of the significantly improved safe handling and storage characteristics in this type of system.
4. This list of agents gives the Soviets an all-season capability for using these agents against an enemy.
5. Production and possession of toxin weapons are banned by the Biological and Toxin Weapons Convention of 1972.

Delivery and Dissemination Systems

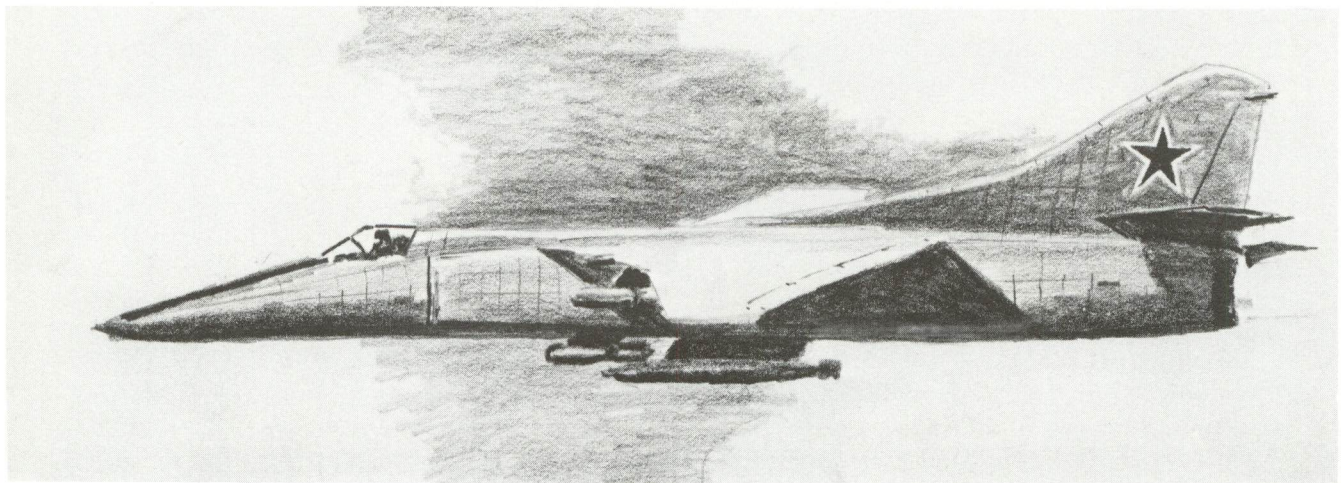
Almost all Soviet conventional weapon systems from mortars to long-range tactical missiles have compatible chemical ammunition or warheads, and are available to their land, air, and naval forces. The Soviets have developed the firing data required to use chemical weapons in battle situations. This includes the types and numbers of weapons required to attack various targets under a variety of weather and combat conditions. They continue to explore and test systems with improved dissemination, larger payload, increased range, and better accuracy. This gives them greater target flexibility and deeper strike capability. They have developed two types of chemical weapons for their tactical missiles — bulk agent and small bomblets which can be dispersed over the target.

SOVIET DELIVERY/DISSEMINATION SYSTEMS

- Missiles
- Artillery
- Mines
- Multiple rail and tube launched rockets
- Fighter-bombers and attack helicopters with aerial bombs, rockets, and spray tanks



Multiround rocket launcher, (BM-21), 122-mm.

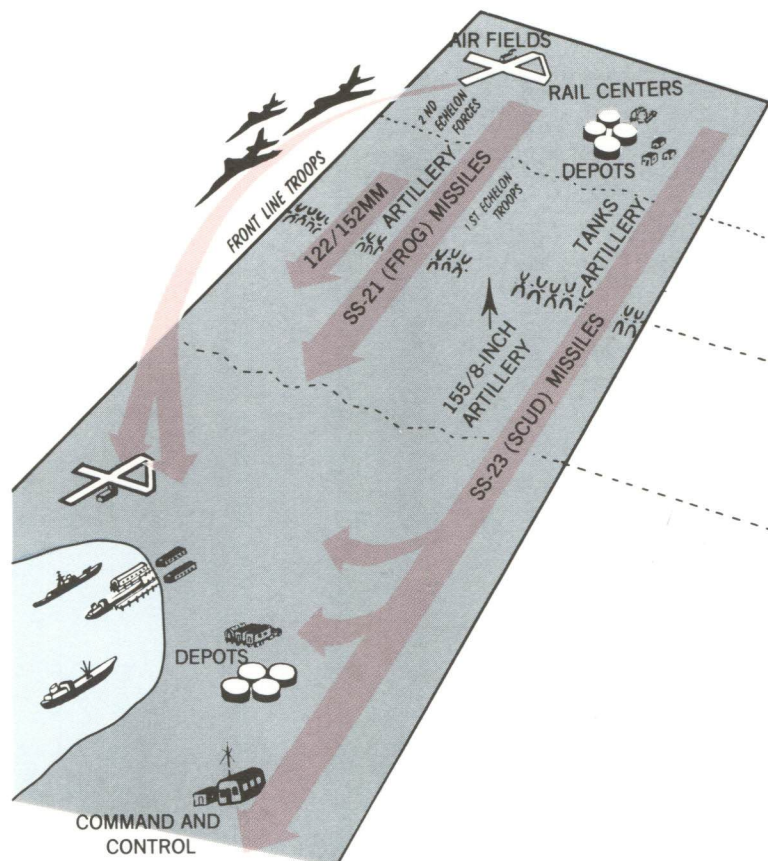


FLOGGER fighter bomber.

THE TARGETS FOR SOVIET CHEMICAL WEAPONS

The Soviets have developed the doctrine and plans for the use of chemical weapons including the targets to be attacked, and Soviet tacticians have standardized the procedures required. If a Soviet Commander determines that a particular battle situation is suited to the employment of chemical weapons, he can conduct strikes against any or all of the targets shown (once the approval to use chemical weapons has been given by the highest Soviet authority). He can select persistent agents or non-persistent agents as well as a variety of delivery systems. He will know the level of contamination he can place on the target. Should his own forces have to cross the contaminated areas, he will have specially trained troop support available for advice, reconnaissance, and decontamination. The scope and versatility of the Soviet chemical weapons arsenal provide the Commander the means to attack and contaminate a full range of targets. An example of the agent concentrations that can be placed on a target by a Soviet surface to surface missile is shown. At least 50% of exposed personnel will be affected. Also shown is the elliptical pattern superimposed on an airfield runway. Use of a persistent agent such as a V-agent would make it extremely difficult to fly operational missions from a contaminated airfield without proper decontamination. In addition to surface-to-surface missiles, fighter bombers play an important role in chemical bomb delivery. A FLOGGER aircraft operating from airfields in East Germany has a radius of operation that covers most of Western Europe.

The chemical strike capabilities of the Soviets in the immediate battle zones and against the rear areas are also shown.



Soviet chemical delivery systems can strike in the front line or rear support areas.



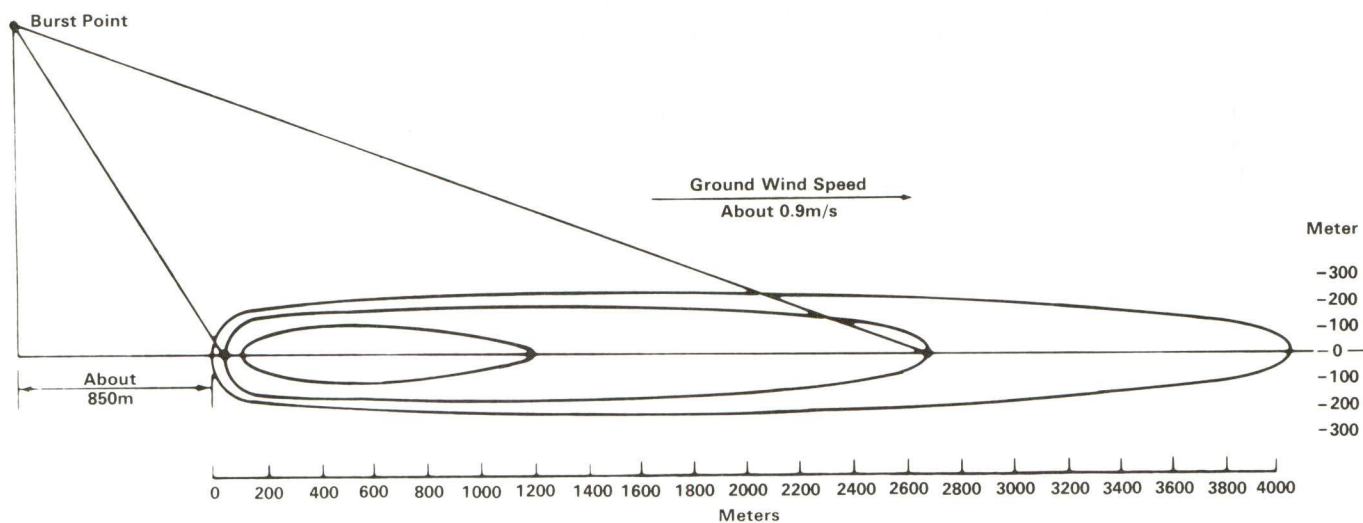
Radius of operation of the FLOGGER fighter-bomber operating from airfields in East Germany covers most of Western Europe. One of its assigned roles is the delivery of chemical bombs on selected targets.

TARGETS FOR SOVIET CHEMICAL WEAPONS

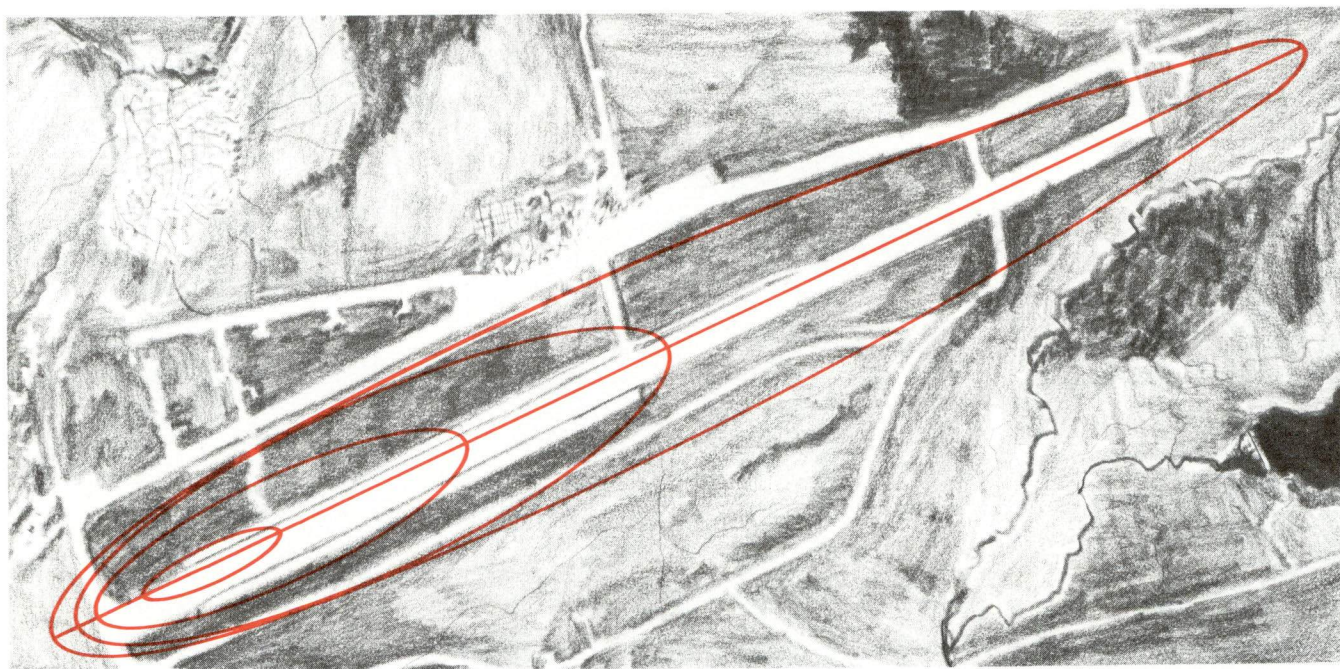
- Nuclear delivery means
- Airfields
- Naval bases and seaports
- Command and control facilities
- Storage depots
- Supply routes
- Troop concentrations
- Artillery and armor
- Amphibious/heliborne landing forces



The SCUD-B is a surface-to-surface tactical missile. It can deliver about 1,100 lbs of chemical warfare agent 180 miles from the launch point.



Typical ground contamination pattern created by a chemical warfare agent delivered by the SCUD missile. All unprotected personnel in the area will be casualties.



The SCUD-B ground contamination pattern superimposed on a military airbase runway. Operational flights from contaminated runways are extremely hazardous and difficult. The Soviets would attack a NATO airbase with many SCUD missiles to ensure coverage.

SOVIET CHEMICAL WEAPONS TESTING, PRODUCTION, AND STORAGE ACTIVITIES

Since the late 1960's the Soviets have continued to test, produce and stockpile chemical weapons. What we have observed over the past 15 years is not what we would expect of a nation that was maintaining a status quo.

Soviet Chemical Weapons Testing

The Shikhany Chemical Warfare Proving Ground is one of the Soviets' primary chemical weapons test areas. It was established in the mid-1920's, and a number of chemical weapons tests were conducted in the late 1920's and 1930's. World War II reconnaissance photography confirmed that Shikhany was an active chemical weapons test facility. Since that time it has grown in size and sophistication and today continues to be a highly active chemical weapons testing facility.

Since the late 1970's, the Soviets have constructed several new chemical agent/weapon test facilities at Shikhany and construction is continuing. The sampling devices used to determine the efficiency of chemical weapons are arranged in grids which have a circular or rectangular pattern. These distinctive grids measure the agent concentration and how well it was dispersed. The shape of the grid and complexity of its pattern depend on the kind of weapon (bomb, artillery, rocket, etc.) and the type of agent being tested.

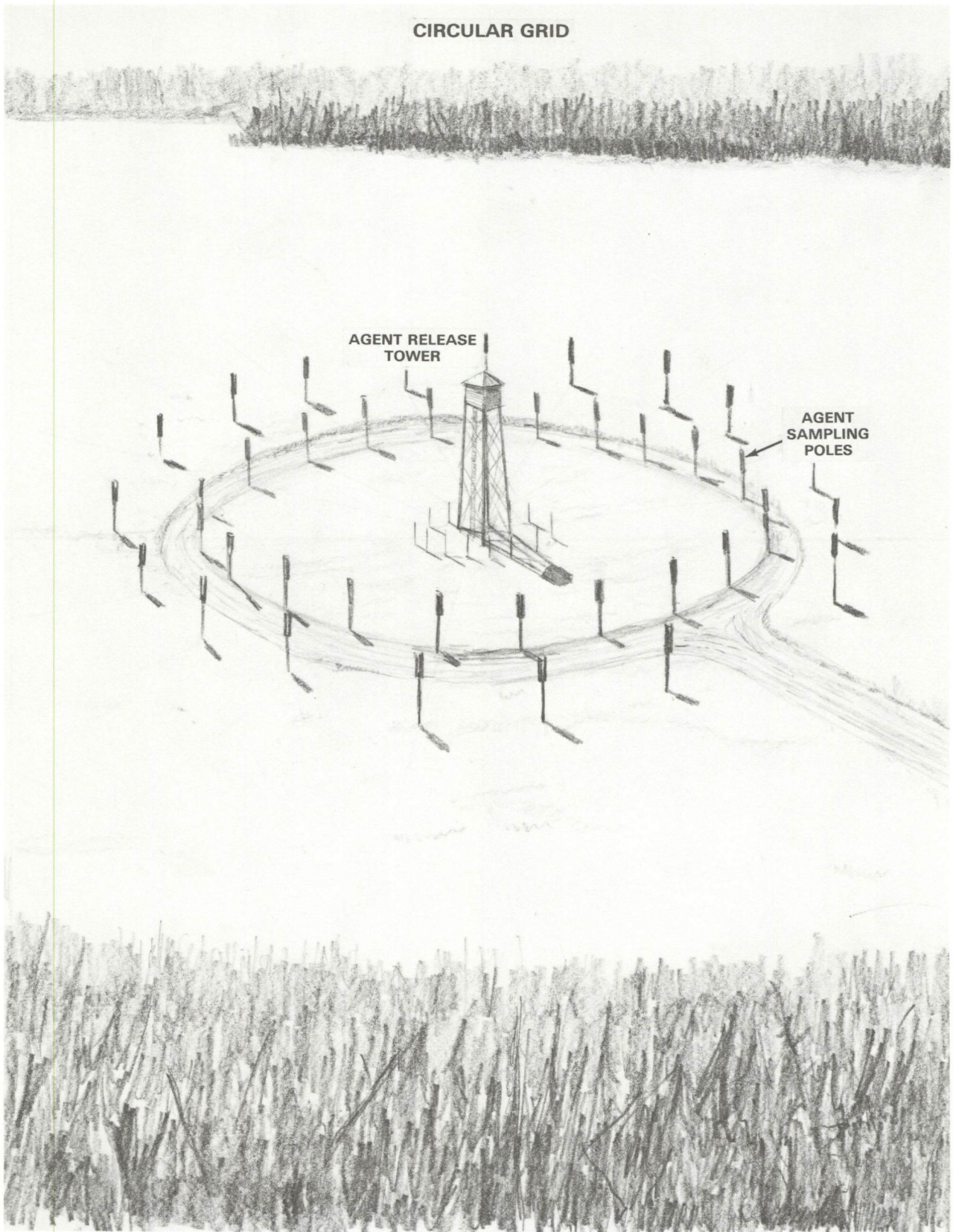
One of the new grids is a circular design. It is used to test the efficiency of a munition in dispersing effective concentrations of chemical agent.

The rectangular grid also shows an example of a chemical weapons test at Shikhany. The impact craters were caused by exploding chemical munitions. The sampling devices are positioned downwind to measure concentration of the agent released. All testing of this kind is done under predetermined wind and temperature conditions. Tests similar to the one shown are continuing. Research, development and production facilities are also located at the Shikhany proving ground.

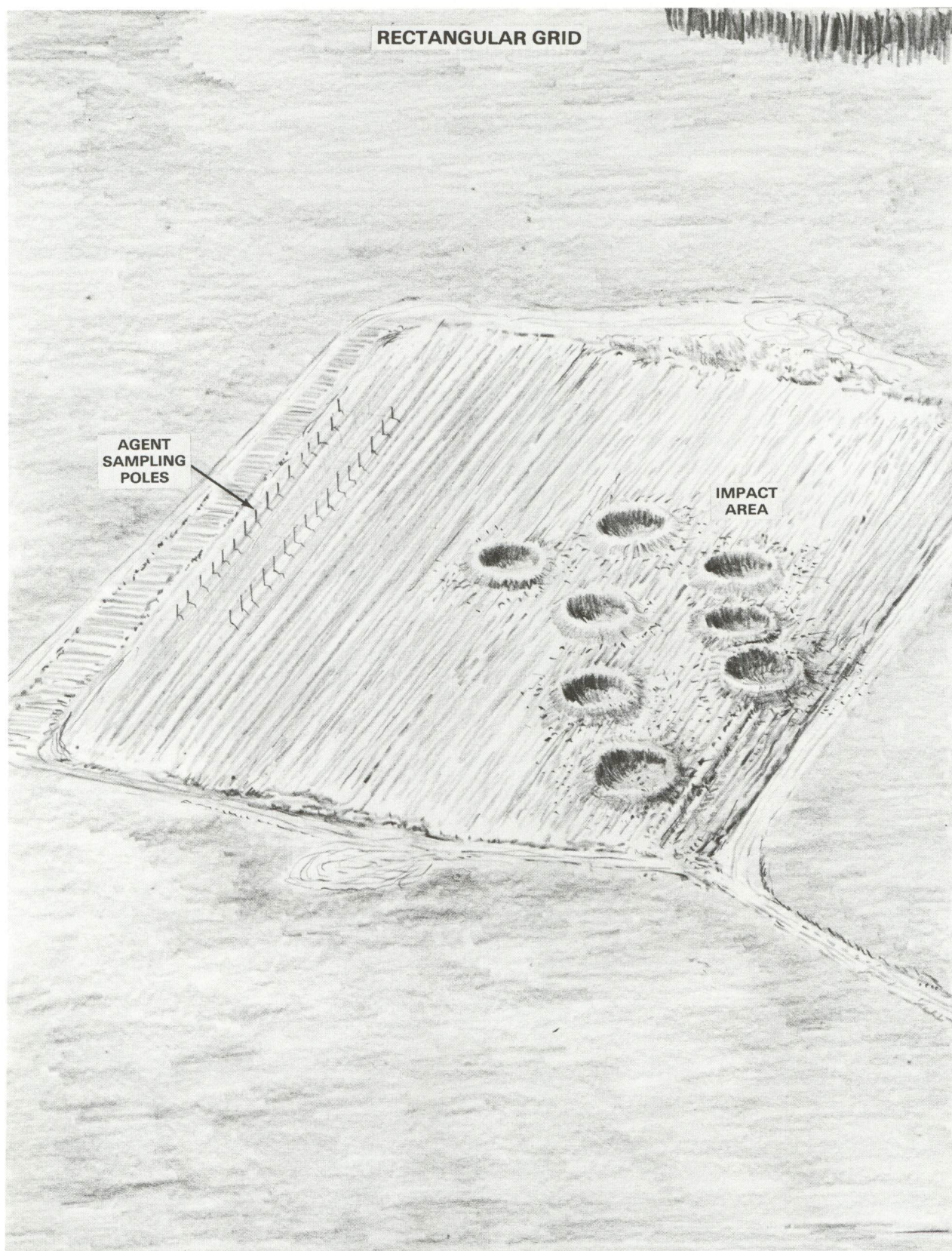


Shikhany chemical proving ground USSR.

CIRCULAR GRID



Chemical agent weapon test grid.



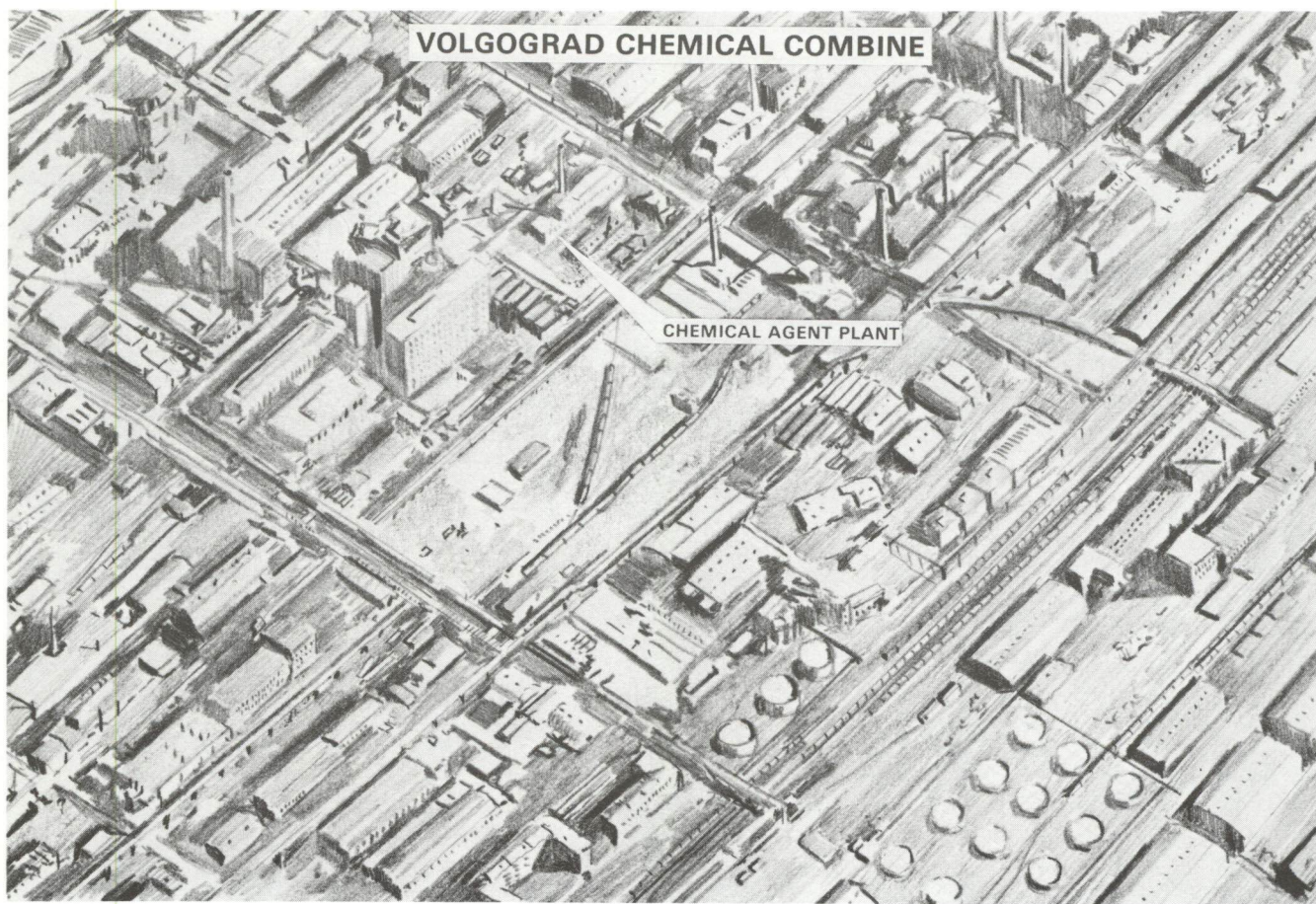
Chemical agent weapon test grid.

Chemical Warfare Agent Production

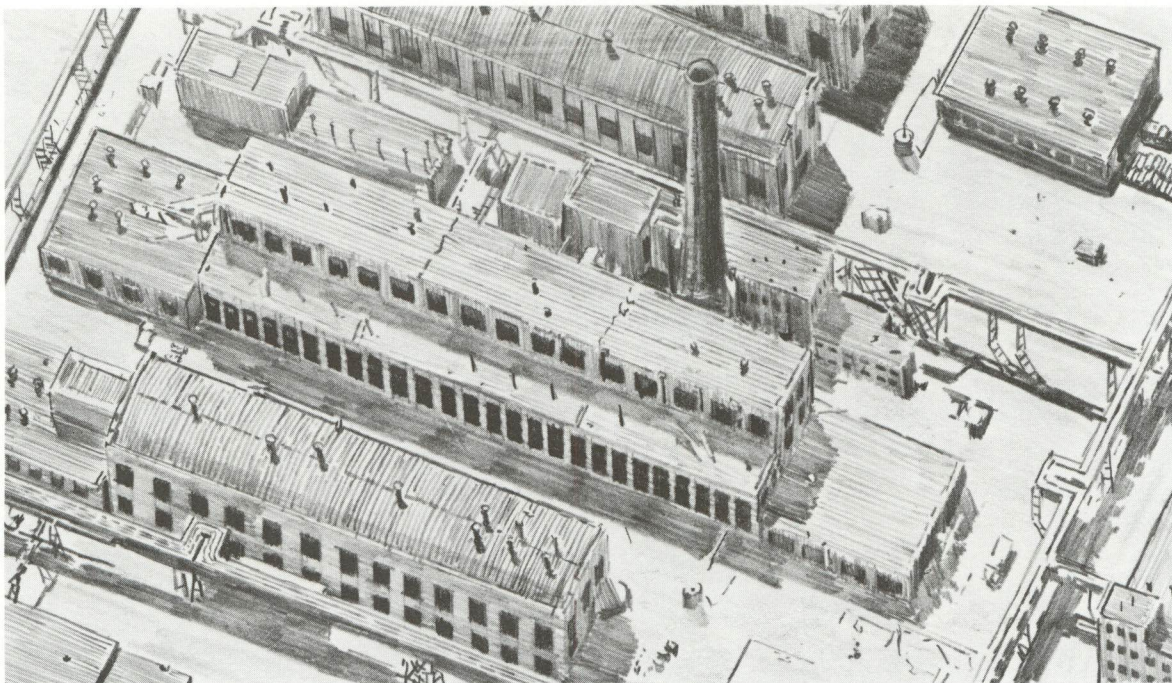
At the end of World War II, the Soviets captured from the Germans large stockpiles of chemical agents, as well as the technology and equipment to make the nerve agents tabun and sarin, and the German plans for production of soman. Two German nerve agent production plants were dismantled and removed to the Soviet Union where they were reassembled. The captured CW agent plant at Volgograd is depicted. The Soviets have continued to develop production capabilities based on this early design and have built agent manufacturing facilities in various locations around the Soviet Union.

Giving chemical warfare capabilities a high priority, the large modern Soviet chemical industry has the capability to produce toxic chemical warfare agents at manufacturing rates sufficient to meet military needs. The industry has had an agent production program since the late 1920's and today can supply a variety of chemical agents such as blister, choking, blood and nerve gases.

There are research institutes in the Soviet Union that are actively engaged in developing the theoretical foundations for producing chemical warfare agents of even greater lethality and designing the equipment necessary to make them.



Location of a nerve agent production plant captured by the Soviets during WWII.



The operational support complex (research, development, and production) at the Shikhany chemical proving ground.



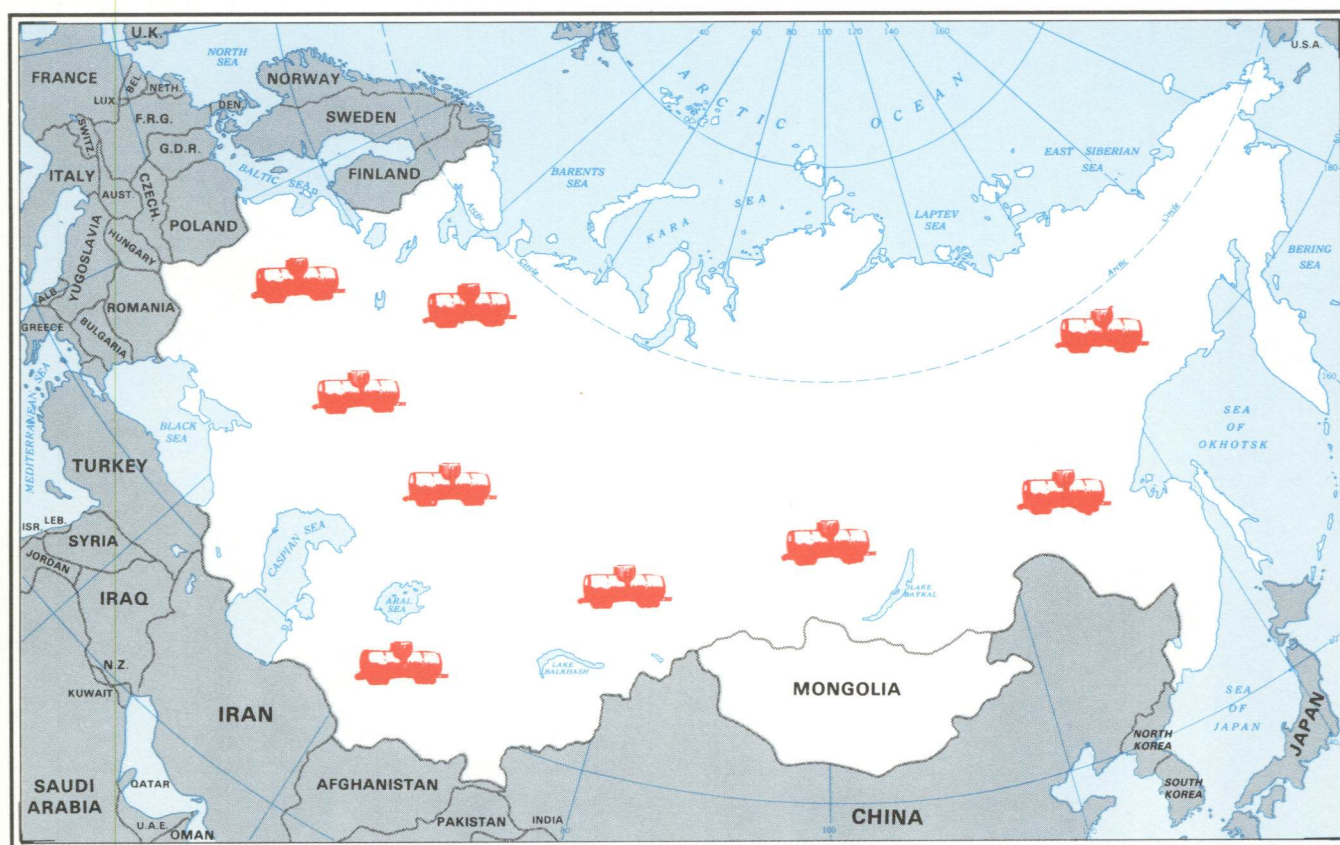
General location of chemical warfare agent production centers in the Soviet Union.

Soviet Chemical Weapons Depots

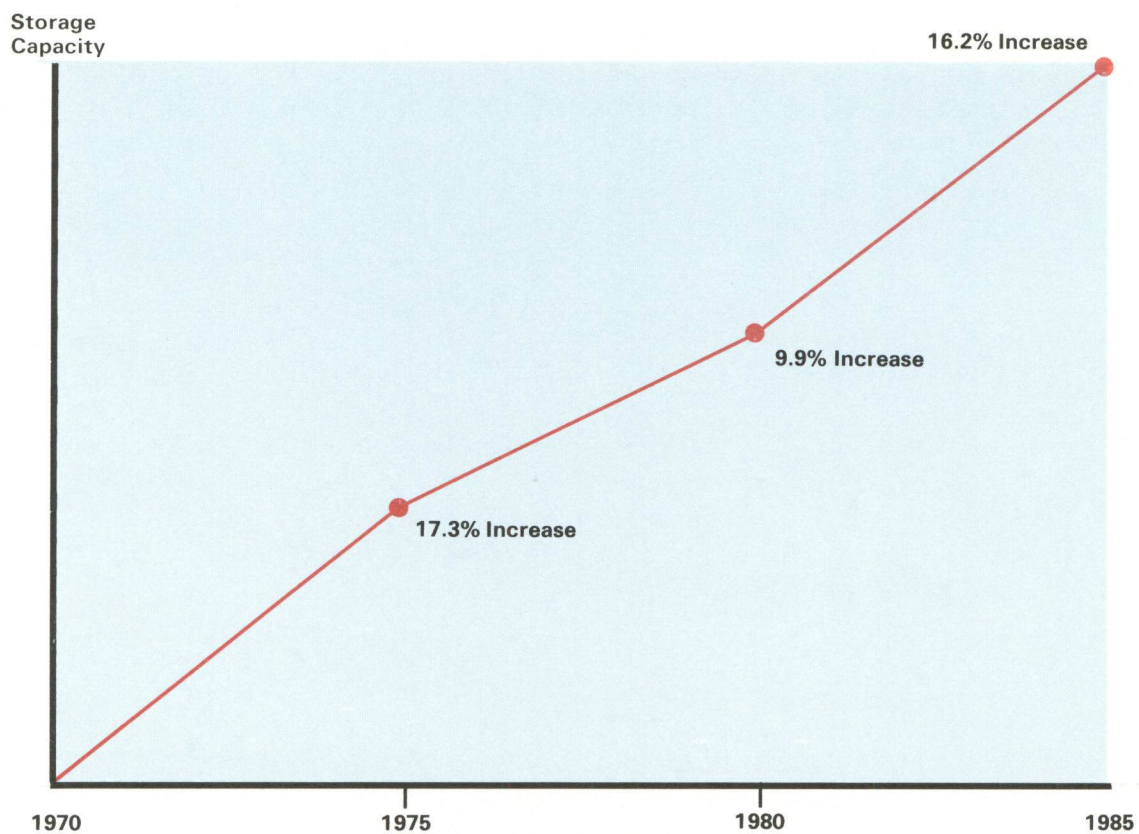
Chemical agents produced over the past five decades are stored in a network of military depots located across the Soviet Union. These depots contain agents in bulk containers and agent-filled munitions, as well as gas masks, protective suits, decontamination solutions, and decontamination vehicles. These depots support operational forces and report to the Headquarters of the Soviet Chemical Troops, in the Ministry of Defense.

Major Soviet chemical warfare storage depots are highly secure military installations. Many depots have rail lines allowing for the rapid mobilization of chemical warfare materials.

Since the late 1960's, the amount of agents, weapons, and material in storage at these depots has increased significantly, and this build up continues. A graphic representation of the increase characteristic of most of these areas is shown.



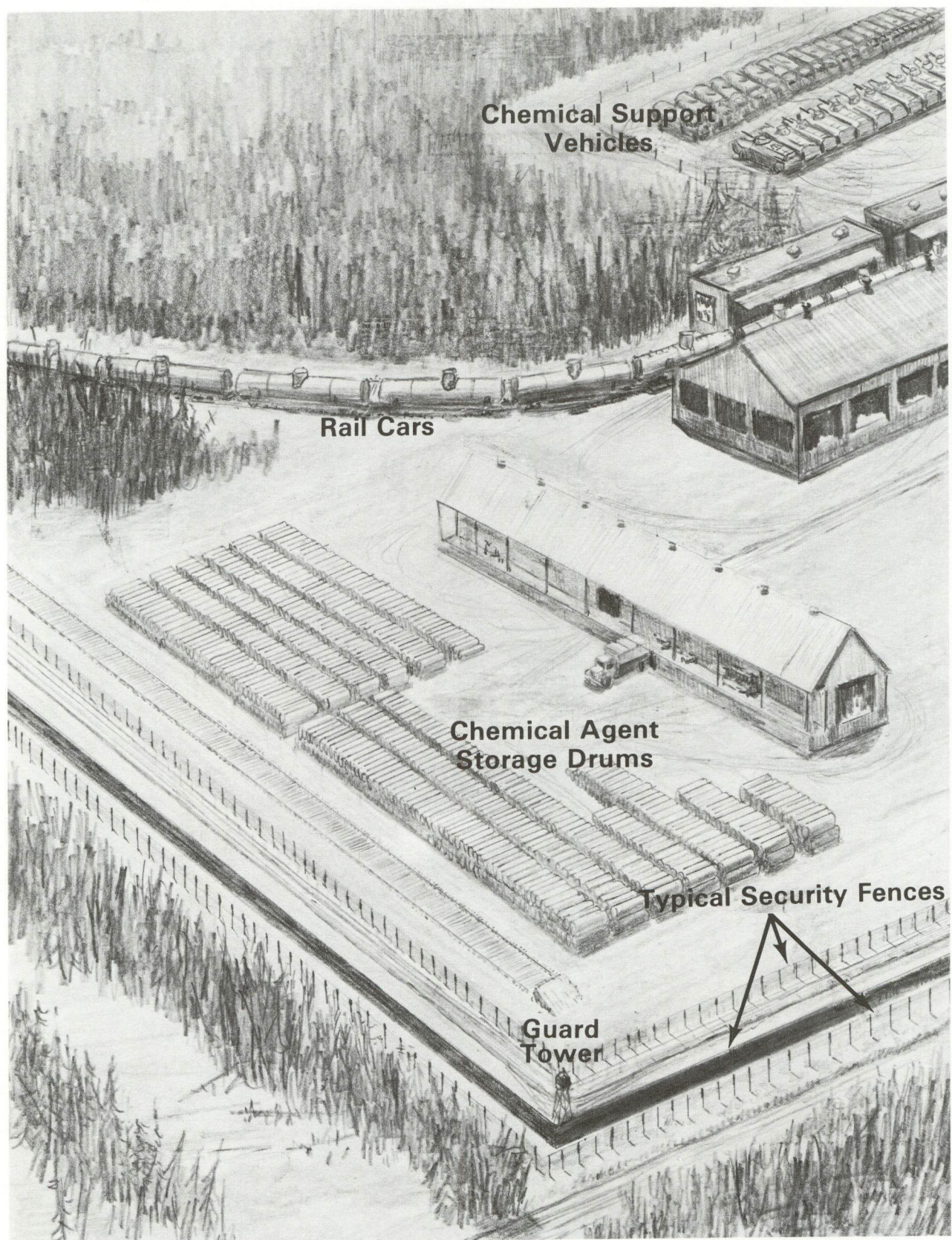
The extent of chemical weapons depots.



Expansion of storage capacity at Soviet chemical warfare depots has been significant.



Chemical munitions are reportedly stored in the forward areas as indicated.



Representative of Soviet chemical depots.

THE SOVIET CHEMICAL WARFARE ORGANIZATION

The continuing chemical weapons activities include a large well-trained chemical warfare organization directed by the Headquarters Chemical Troops in the Ministry of Defense. This chemical warfare organization is headed by a three-star General and numbers more than 45,000 officers and enlisted men in the ground forces alone. When staffed during a war, the size will double. Their primary responsibilities include the following:

- Technical advisors to the front commanders for chemical weapons and results of their use
- Research and development programs for weapons and protection
- Production and storage of chemical weapons and protective materiel testing and evaluation
- Training of all forces for chemical employment and survival on a contaminated battlefield
- Decontamination and reconnaissance
- Operating the chemical academies (college equivalent)

This corps of specialists also has about 30,000 special vehicles for decontamination and reconnaissance and has developed more than 200 areas for teaching and training all forces on how to protect themselves and clean up following combat where chemical weapons have been used. This training includes the use of actual chemical agents. Also, the Soviets have installed protective filtration systems in many combat and combat support vehicles and ships.

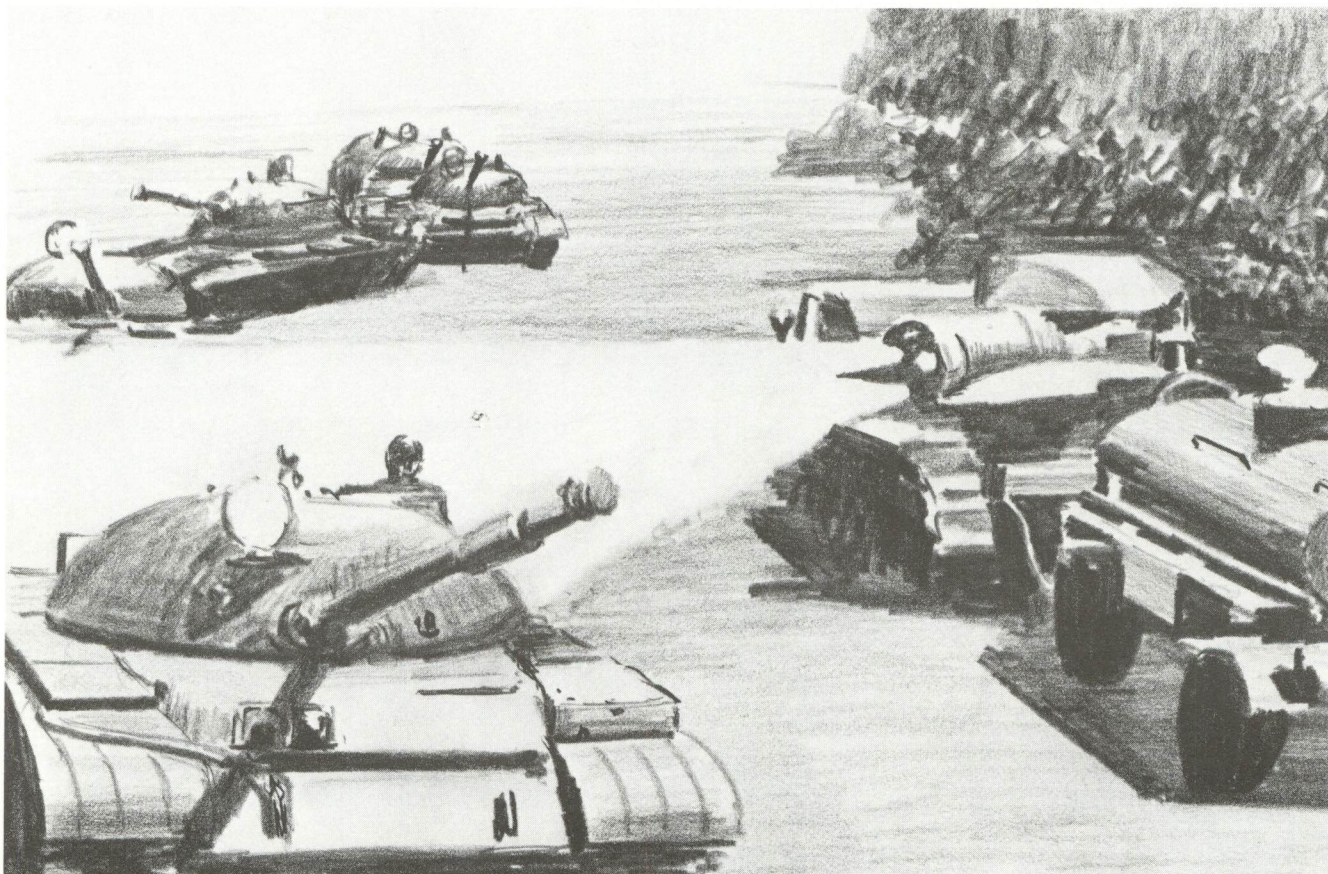
Continuing activities include the development, testing and evaluation of new chemical agents and weapon systems, protective antidotes against chemical agent poisoning, new suits and gas masks, decontaminating solutions and new vehicles with filtration systems.

A significant characteristic of protective equipment, including Soviet models, is the physical burden associated with prolonged wear, especially in warm temperatures. The equipment is bulky and uncomfortable. When worn for an extended period of time in hot weather soldiers become fatigued rather quickly and combat efficiency is lowered. In some cases heat prostration may result. Accordingly, the Soviets have devised norms stipulating desired maximum lengths of time for various temperature ranges for wearing protective suits.

Temperature (Centigrade/Fahrenheit)		Time Spent in Protective Suit
30° and above	86° and above	15-20 minutes
25°-29°	77°-84°	Up to 30 minutes
20°-24°	68°-75°	40-50 minutes
15°-19°	59°-66°	1.5-2 hours
BELOW 15°	BELOW 59°	More than 3 hours

Soviets use these norms as guidelines only because they realize that certain situations may require troops to wear protective suits beyond desired maximum times. The Soviets acknowledge that a 50% decrease in the work pace will occur after personnel have spent six continuous hours in full protective equipment, though this can be reduced by rests and spraying the protective suit with water to cool it. A Soviet example of the degrading effect on troop operations, when suits are worn for too long, describes a potentially disastrous mistake made by one of their artillery officers who had worn his protective suit for too long in temperatures above 30°C/86°F. Apparently unable to concentrate because of his impairment, he prepared firing data from the wrong firing tables. Recognizing this factor the Soviets basically call for more training in protective suits to improve physical and psychological conditioning.

The Soviet concept of maintaining the momentum of attack presupposes a capability to decontaminate armored fighting vehicles rapidly and return them to combat as fast as possible. A jet decontamination apparatus, the TMS-65, satisfies this requirement. It consists of an aircraft turbojet engine mounted on a URAL-375 truck chassis which sprays decontamination solution. An operator directs the jet engine's hot exhaust gases at contaminated vehicles. He may mix water or a decontamination solution intermittently into the exhaust. The TMS-65 normally is employed in pairs, positioned on both sides of a road. A contaminated vehicle passing between them can be decontaminated in less than a minute. Other equipment used to maintain the momentum of attack are the ARS-14 (equipment and terrain decontamination); AGV/DDA (personnel and clothing decontamination); and the DK for partial decontamination of combat crews.



The TMS-65 decontaminating tanks.

THE SPREAD OF CAPABILITIES AND USE

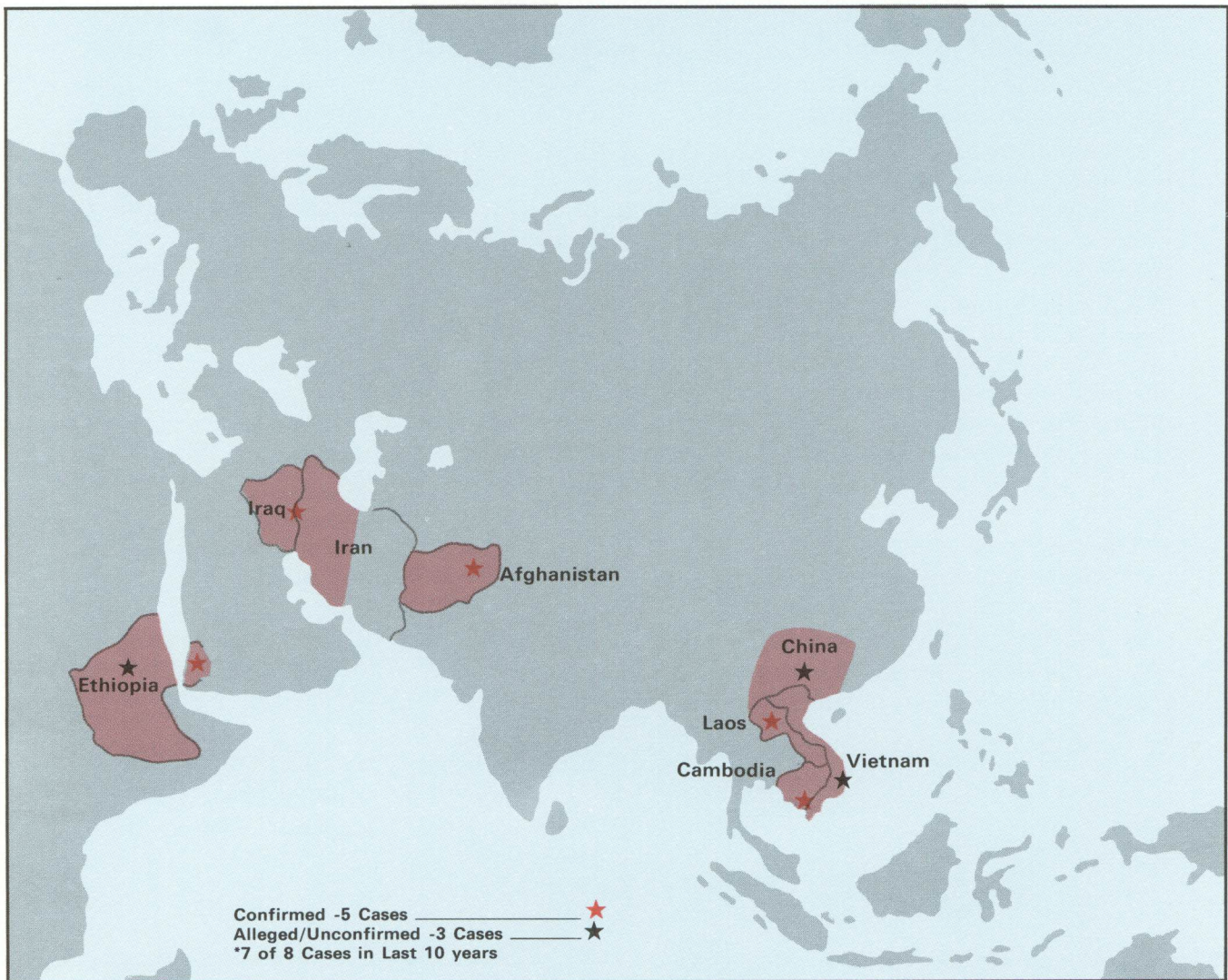
The Soviet Union continues to represent the major chemical weapons threat to the US. However, chemical weapons are spreading to nations outside the NATO/Warsaw Pact. US forces may face a chemical weapons threat in a significant number of other nations.

Chemical weapons have been used during the Egyptian-Yemeni war in the 1960's; in Southeast Asia and Afghanistan beginning in the mid-1970's and continuing into the early 1980's. There have also been allegations of chemical weapons use in the Ethiopian-Eritrean conflict and during the brief war between the Peoples Republic of China and North Vietnam. Most recently chemical weapons have been used in the Iraq-Iran war.

We have observed that as some nations have used these weapons, a number of others have developed a strong interest in acquiring them. Some are trying to find suppliers, others are making determined efforts to acquire the technology and equipment to produce chemical weapons independently in-country. None of these countries is capable of producing thousands of tons of chemical warfare agents at the present time. Over a period of time and as they improve their expertise and production capacities they will progress to production of larger tonnages of chemical warfare agents and will be developing delivery systems.

There are now 11 nations outside the NATO/Warsaw Pact that have chemical weapons in their arsenals and two more that are attempting to acquire them. More countries now have a chemical weapons capability than at any time in the past.

Our forces as well as those of our allies must be alert to the fact of chemical weapons acquisition by such nations. Both military and security forces must also be alert to the possible use of these weapons by terrorist groups and clandestine forces.



Where chemical weapons have been used since 1975.