

# **U.S. Virgin Islands Energy Emergency Plan**

**April, 1991**

**Prepared for  
U.S. Virgin Islands Energy Office**

**by  
The Strom Thurmond Institute of Government and Public Affairs  
Clemson University**

## TABLE OF CONTENTS

### GENERAL INFORMATION

|                                                                                                                      |    |
|----------------------------------------------------------------------------------------------------------------------|----|
| Chapter I: Introduction .....                                                                                        | 1  |
| Purpose .....                                                                                                        | 1  |
| Dimensions of the Problem .....                                                                                      | 1  |
| Suggested Elements of Energy Emergency Planning .....                                                                | 7  |
| Chapter II: Statutory Authority, Administrative Procedures, and Emergency<br>Declaration in the Virgin Islands ..... | 11 |
| U.S. Virgin Islands Energy Emergency Policy .....                                                                    | 11 |
| Authority: Statutes, Regulations and Executive Orders .....                                                          | 11 |
| Legal Issues in Energy Emergency Planning .....                                                                      | 12 |
| Activating the Plan .....                                                                                            | 12 |
| Virgin Islands Energy Organizational Response .....                                                                  | 12 |
| Virgin Islands Energy Office (VIEO) Responsibilities .....                                                           | 18 |
| VIEO Roles During Energy Emergencies .....                                                                           | 18 |
| Chapter III: Energy Emergency Preparedness Planning Concepts .....                                                   | 19 |
| Defining an Energy Emergency .....                                                                                   | 19 |
| Establishing Planning Objectives .....                                                                               | 21 |
| Energy Emergency Preparedness Planning Elements .....                                                                | 22 |
| Chapter IV: Economic Assistance Programs in the Virgin Islands .....                                                 | 37 |
| Social Issue .....                                                                                                   | 37 |
| The Nature of the Issue .....                                                                                        | 37 |
| Remedies .....                                                                                                       | 37 |
| Examples of Programs .....                                                                                           | 38 |
| Chapter V: Training and Exercise Programs .....                                                                      | 39 |
| Introduction .....                                                                                                   | 39 |
| Contingency Planning Exercises and Simulations .....                                                                 | 39 |
| Interagency Training .....                                                                                           | 39 |
| Data/Information and Analysis Training .....                                                                         | 40 |
| Disaster Preparedness .....                                                                                          | 40 |
| Chapter VI: Federal Roles and Response Mechanisms to Energy Emergencies .....                                        | 41 |
| Federalism and State Initiatives in Contingency Planning .....                                                       | 41 |
| The Free Market Principle .....                                                                                      | 41 |
| Free Market and Government Responses During an Energy Emergency .....                                                | 41 |
| Office of Energy Emergencies .....                                                                                   | 43 |
| Energy Emergency Management System .....                                                                             | 44 |
| Domestic Response Structure .....                                                                                    | 47 |
| Programs to Meet Defense Petroleum Needs .....                                                                       | 49 |
| Energy Savings: Federal Energy Management Program .....                                                              | 50 |

|                                                          |          |
|----------------------------------------------------------|----------|
| Energy Emergency Measures .....                          | EEM 1-19 |
| Public Information Program .....                         | EEM-1    |
| Work Pattern Changes .....                               | EEM-2    |
| Emergency Petroleum Product Set-Aside Program .....      | EEM-3    |
| Water and Power Services .....                           | EEM-4    |
| Water Demand Reduction-Mandatory Mode .....              | EEM-5    |
| Voluntary Driving Habits and Vehicle Maintenance .....   | EEM-6    |
| Minimum Acceptable Inventory Level-Mandatory Mode .....  | EEM-7    |
| Fuel Sales Measures .....                                | EEM-8    |
| Transportation Services .....                            | EEM-9    |
| Allocation of Reduced Supply Volume-Mandatory Mode ..... | EEM-10   |
| Hot Water Setback-Mandatory Mode .....                   | EEM-11   |
| Building Temperature Adjustments-Mandatory Mode .....    | EEM-12   |
| Service Reductions-Mandatory Mode .....                  | EEM-13   |
| Ridesharing .....                                        | EEM-14   |
| Speed Limit Measure .....                                | EEM-15   |
| Backup Power Distribution .....                          | EEM-16   |
| Oil Spills .....                                         | EEM-17   |
| Energy Resources .....                                   | EEM-18   |
| Encouragement of Tourism .....                           | EEM-19   |

|                |     |
|----------------|-----|
| GLOSSARY ..... | G-1 |
|----------------|-----|

## APPENDICES

|                                                                          |      |
|--------------------------------------------------------------------------|------|
| Appendix A: Individual Agency Responsibilities .....                     | A-1  |
| Appendix B: Energy Emergency Measures .....                              | A-7  |
| Appendix C: Energy Emergency Contacts and Phone Numbers .....            | A-9  |
| Appendix D: Energy Emergency Industrial Contacts .....                   | A-11 |
| Appendix E: Bill No. 16-0698/Act No. 5233 .....                          | A-13 |
| Appendix F: Executive Order No. 13 .....                                 | A-23 |
| Appendix G: Federal Laws Relating to Energy Emergency Preparedness ..... | A-33 |

## GENERAL INFORMATION

## **CHAPTER I**

### **INTRODUCTION**

#### **A. Purpose**

The purpose of this plan is to provide guidance for the preparedness, mitigation, and energy emergency response mechanisms to ensure reliable supplies of energy during disruptions, especially to the priority industry sectors, the emergency service providers and the general public.

Energy emergency preparedness is a specific and separate area of planning emphasis for emergency planners because of the economic impacts, legal issues and complex relationships which must be addressed. Historically, the management of energy supplies under emergency conditions has been a reaction to disruption, rather than proactive, pre-emergency preparation. Future energy emergency management requires a focus on the causes and management of the effects of energy disruptions, which might include international political dynamics, national security issues, natural disasters, sabotage or major accidents involving energy systems and changing patterns in energy production, transportation and distribution. The impact of energy emergencies upon the environment presents threats to our ecosystems, requiring immediate and long term solutions. Additionally, local crisis management of a natural disaster such as the recent experience with Hurricane Hugo also presents challenges and concerns for energy emergency officials.

Given the heavy dependence upon petroleum, the importance of energy preparedness to the U.S. Virgin Islands should not be underestimated. The inability to provide power for electricity and desalination of water as well as the economic impact of a disruption in fuel supply would be devastating. Without fuel for land transportation, airlines, shipping and cruise ships, there would be severe effects on quality of life and limitations on tourism affecting sales, taxes and per capita income. In addition, environmental impacts would cause great loss to the U.S. Virgin Islands not only in terms of health and aesthetic beauty but also in terms of economic well-being for commercial support and tourism. An integrated response is essential for the survival of the Territory's economic and environmental vitality.

#### **B. Dimensions of the Problem**

Energy emergencies on the mainland affect the Territory and vice versa. For this reason, it is important to understand the nature of energy emergencies that affect the United States in order to effectively formulate Territorial contingency plans designed to interface with Federal initiatives.

No government has the resources to mitigate every possible energy emergency. However, according to Economic Research Associates, by employing seriousness and probability targeting, available resources can be engaged towards those threats for which the Territorial government can have the greatest mitigation management impact.

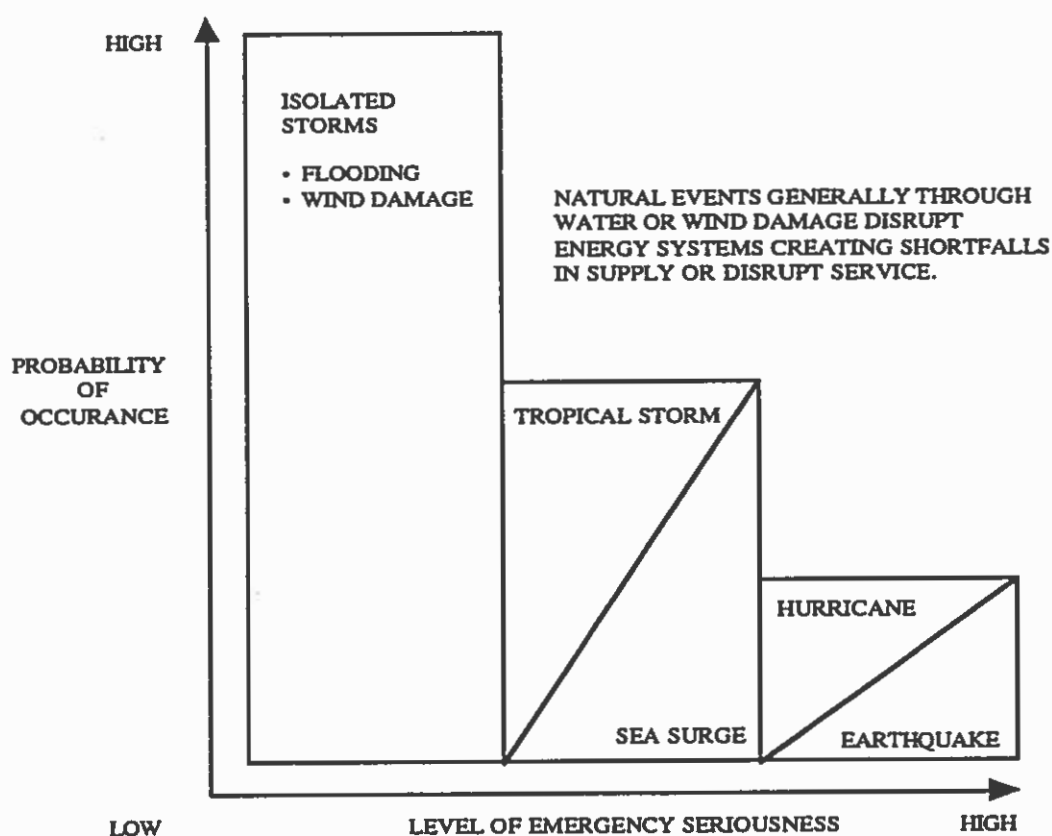
Generally, the level of seriousness and the probability of occurrence of an energy emergency have a negative correlation so that as the seriousness of the event increases, the chance of occurrence decreases and vice versa. (See Figure 1.) Based on these relationships, the Territorial government should consider assuming a priority oriented energy emergency mitigation and management policy.

and encompassing those which bear upon energy infrastructure such as earthquakes and storms. FEMA coordinates with other Federal agencies as required and provides assistance to state, territorial, and local governments which may include disaster relief funds at the direction of the President of the United States.

#### a. Energy Disruption by Natural Disaster

The Virgin Islands is susceptible to natural threats ranging from the isolated storm which downs some power lines and leaves a small area of electric consumers without power to the devastation caused by events such as Hurricane Hugo. Naturally occurring energy emergencies include disruptions in supply and possibly some short-term increases in energy prices. These crises are normally short in duration lasting from a few hours to less than a year, and because a natural disaster is usually not geographically widespread, longer-term supply disruptions and price increases are mitigated. (See Figure 2.)

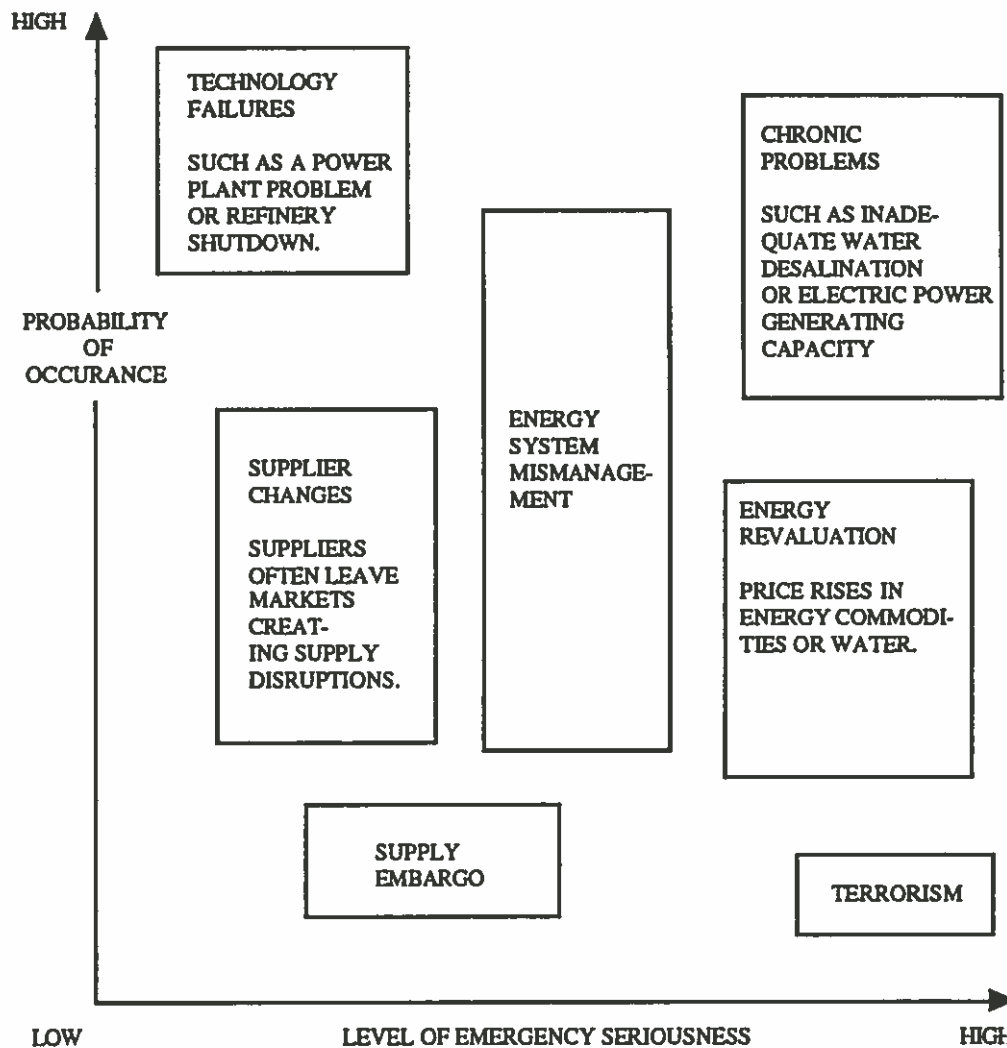
**FIGURE 2**  
**Natural Causes of Energy Emergencies**



Source: Economic Research Associates, *Considerations for Energy Emergency Planning* (draft), 1989

On September 17, 1989, Hurricane Hugo hit the U.S. Virgin Islands with winds estimated at 200 mph at landfall on St. Croix. It continued with lower winds to Puerto Rico and South Carolina. The storm blew inland with unexpected force, causing extensive damage through the low country of South Carolina, through the Piedmont and into Charlotte, North Carolina, finally blowing itself out in northern North Carolina.

**FIGURE 3**  
**Human Causes of Energy Emergencies**



Source: Economic Research Associates, *Considerations for Energy Emergency Planning* (draft), 1989

In addition, given the islands near total dependance upon petroleum for power generation, potable water production and meeting fuel needs, as well as the corresponding likelihood of longer-term real prices in petroleum products, the Islands' economy is constantly overshadowed by the threat of energy inflation. From a relative vulnerability standpoint, other places with more diversified energy supplies inherently have less risk from structural changes in petroleum costs.

Some emergencies require a more massive and often Federally-coordinated effort. An example is terrorism. World-wide, terrorism has been rising about 10 to 15 percent per year. In the United States, multi-site sabotage and terrorist incidents represent potential threats, but sabotage involving our electric power systems has not reached a level of severity to cause a major sustained outage. However, many countries, such as El Salvador, Peru, Chile, Colombia, Mozambique, Afghanistan, and Guatemala, have experienced substantial power system disruptions because of terrorism.

## **C. Suggested Elements of Energy Emergency Planning**

### **1. National Governor's Association**

The National Governors' Association has called for strategies for responding to a variety of possible energy emergencies.

It is . . . imperative that the states, territories, and Federal government develop strategies for responding to a broad variety of possible energy emergencies. Initial efforts should focus on strategies to prevent emergencies from occurring and to reduce the severity when they do occur. Efforts to diversify our energy systems while maximizing our use of cost-effective domestic energy resources are part of this long-term effort. Additional efforts in the interim must focus on planning the response that the Federal and state governments would take if any energy emergency occurs. It is essential that emergency response procedures be well tested to ensure the coordination and flow of information between energy suppliers, consumers, and Federal, state, territory and local governments.

(Source: Strom Thurmond Institute, *Guidelines for State Energy Emergency Preparedness* (draft), 1990)

### **2. National Association of State Energy Officials**

The National Association of State Energy Officials (NASEO) considers energy emergency preparedness planning as a national priority, stressing cooperation between the private sector and national, state, territorial, and local governments.

National energy policy must clearly recognize that rising energy imports increase the nation's vulnerability to an energy supply disruption. Reliance on the free market to meet the nation's energy needs at the lowest cost must be tempered by the realization that the market discounts their longer-term national security considerations and energy and environmental implications to the nation's economy. Furthermore, even with today's relative energy supply abundance, an energy supply emergency could be triggered by an act of terrorism in our own country which could have widespread impacts on the supply and distribution of energy. Therefore, it is the responsibility of the Federal, state and territorial governments to focus on preparing a coordinated, interrelated, and flexible strategy to meet any energy emergency which mitigates the impact on the nation's economy and balances regional effects of an energy supply disruption. Foremost in the formulation of an energy emergency response capability is the establishment of clear lines of communication and jurisdiction between the Federal government, states, territories and the energy industry.

NASEO emphasizes that "a balanced policy must account for regional disparity and vulnerability while protecting the health and welfare of the nation's citizens, businesses and industries."

(Source: Strom Thurmond Institute, *Guidelines for State Energy Emergency Preparedness* (draft), 1990)

### **3. Office of Energy Emergencies Regional Energy Emergency Planning Seminars**

During the 1989 and 1990 regional seminars sponsored by the Office of Energy Emergencies, many concerns and ideas were expressed regarding the Federal, state, territorial, and industry roles in energy emergency preparedness. Major ideas suggested in the course of the regional seminars included:

- a. the need for clearly defined energy emergency plans to cope not only with physical damage and dislocation of supplies, but also to deal with potential sudden price increases during any energy crisis;

- a. The Office of Energy [Emergency] Preparedness in DOE should continue, expand, and routinize its coordination and informational activities with state and territory energy offices as well as with industry. Adequate preparedness for future energy disruptions and emergencies will require continuity of information, workable communication networks among responsible parties, and an improved ability to transfer successful programs from state to state or territory.
- b. The Strategic Petroleum Reserve represents one of the most significant insurance policies available for energy emergencies. Effective management of future crises requires public confidence that SPR oil will be made available immediately. DOE should evaluate the desirability of a policy to sell SPR oil at prices equivalent to those prior to the crisis to reduce the incentives for bidding up the price of oil. In addition, DOE should evaluate the size of the SPR to determine if increasing the reserve is feasible and desirable.
- c. The availability of Federal revenues can provide a significant insurance policy to overcome the budget constraints of state/territory energy offices and to address equity problems at the state/territory level. DOE should explore the appropriateness of additional safety-valve mechanisms, such as using a percentage of SPR drawdown revenue for state/territory uses.
- d. Congress should be encouraged to make sufficient funds available to states and territories for energy emergency planning. Funds should be significant enough to provide incentive for enhancing the continuation of many activities, to improve regional and sub-state/territory coordination, and to reduce recent trends in many states that have reduced overall response capability. Such funds should further be used by states and territories to assist the public in responding to changing market conditions by identifying alternative energy supply options.
- e. DOE's Office of Energy Emergencies should create an Exemplary Projects Program to help strengthen state/territory capacity to respond to energy disruptions. The program would be intended to encourage states and territories to develop measures that facilitate responses and adjustments by the private sector to energy emergencies. The program could emphasize such areas as innovations in program implementation and provide mechanisms to make this knowledge available to other states and territories.
- f. DOE should perform or sponsor policy analysis and risk analysis to better identify, characterize and compare threats to the security of U. S. energy supplies as well as the consequences. The results should be shared with states, territories and private industry. For example, immediate attention should be given to developing an evidentiary base about the likelihood and severity of potentially disruptive events as a prerequisite to addressing the vulnerability of energy systems.
- g. All states/territories should establish the authority and prepare a plan for a petroleum set-aside program that would be available for an emergency. The conditions under which the set-aside would be used could vary substantially from state to state and territory.
- h. States/territories should develop minimum gasoline purchase rules as part of their emergency preparedness.

## **CHAPTER II**

### **STATUTORY AUTHORITY, ADMINISTRATIVE PROCEDURES, AND EMERGENCY DECLARATION IN THE U.S. VIRGIN ISLANDS**

#### **A. U.S. Virgin Islands Energy Emergency Policy**

Responses to the effects of an energy emergency in the U.S. Virgin Islands are designed to take into consideration the basic energy emergency management policies of the Territorial government as follows:

1. Preference for voluntary rather than mandatory measures;
2. Exercise all efforts to prevent unnecessary hardship and threats to health and human safety and
3. Identify energy emergency priority actions in order to minimize the economic impacts of energy disruptions.

#### **B. Authority: Statutes, Regulations and Executive Orders**

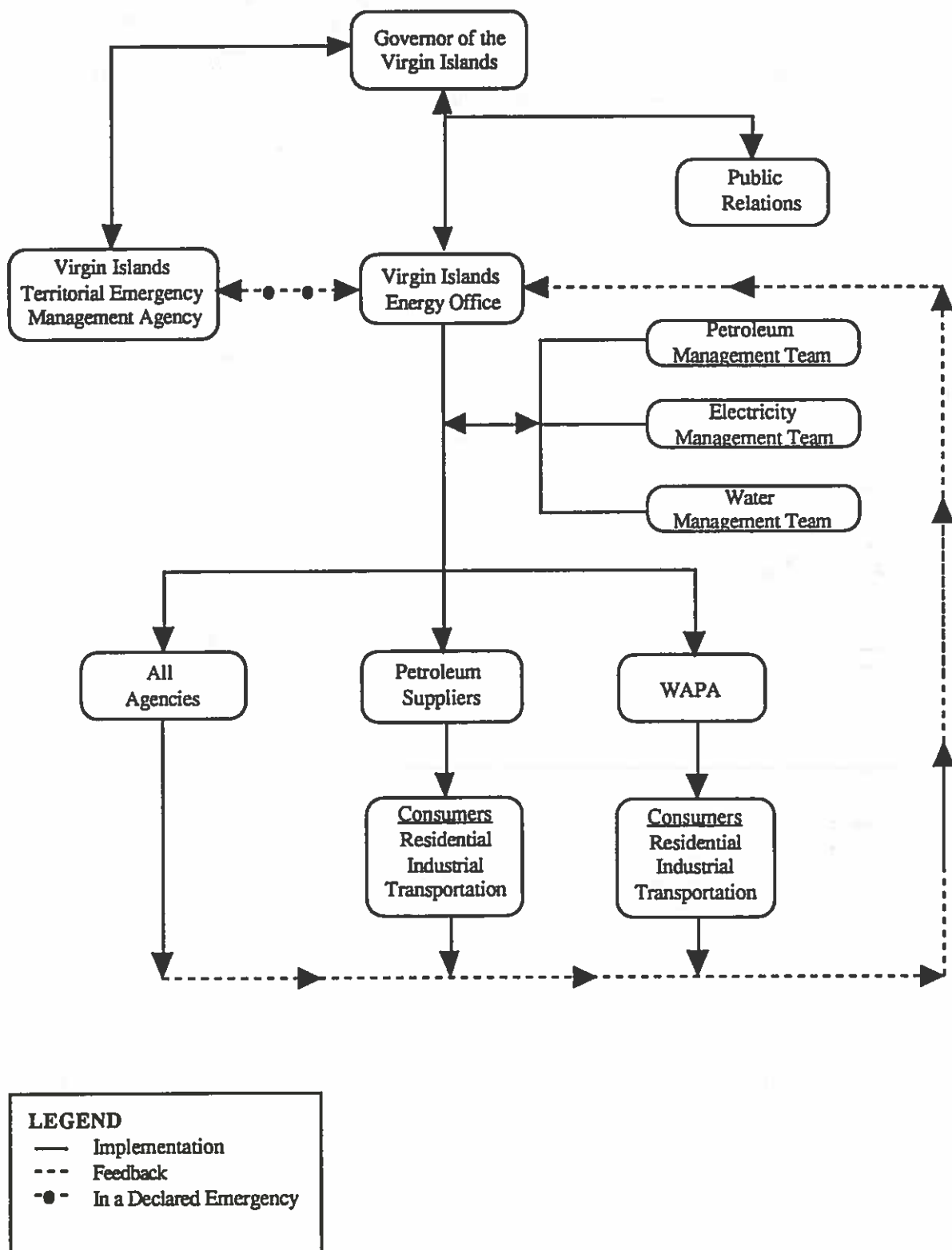
Whereas there is no explicit information regarding the Governor's authority and role during an energy emergency, there is statement of authority pertaining to times of natural disasters and emergencies. A disruption in energy flow frequently occurs during such a time; thus it is implied that the Governor assumes responsibility for an energy emergency.

During times of emergency or natural disaster, or the imminent occurrence of such an event, the Governor has authority to declare a state of emergency by Executive Order or Proclamation. The state of emergency shall exist until the threat or danger has passed or until the response and recovery has progressed to the point that a state of emergency no longer is appropriate. If circumstances warrant a state of emergency to exist for more than 30 days, the Governor must renew the Executive Order or Proclamation. After the issuance of a declaration by the Governor, disaster preparation, response and recovery aspects of the Territorial and interjurisdictional emergency and major disaster plans applicable to the area in question are activated. The Governor's declaration also authorizes the deployment and use of any forces to which the plan(s) may apply in the use and distribution of supplies, equipment, materials and facilities.

The Governor is responsible for addressing the dangers to the Territory and people presented by emergencies or major disasters. During any state of emergency or major disaster the Governor shall be commander-in-chief of the Police Auxiliary and of all other forces available for emergency duty. Additionally, during a state of emergency, he may take any action that is deemed necessary for the health, welfare and safety of the residents of the U.S. Virgin Islands.

In the event the Governor or the Lieutenant Governor of the U.S. Virgin Islands is unable to direct the response during an emergency, the Adjutant General will act as director and coordinator. The Adjutant General shall act as the principal assistant and advisor to the Governor with respect to emergency management and disaster preparedness planning for the Territory, and in this capacity shall act on behalf of the Governor, as required, in coordinating and directing governmental and nongovernmental emergency service agencies.

**Figure 4**  
**Administrative Flow for Implementation of Energy Emergency Program**



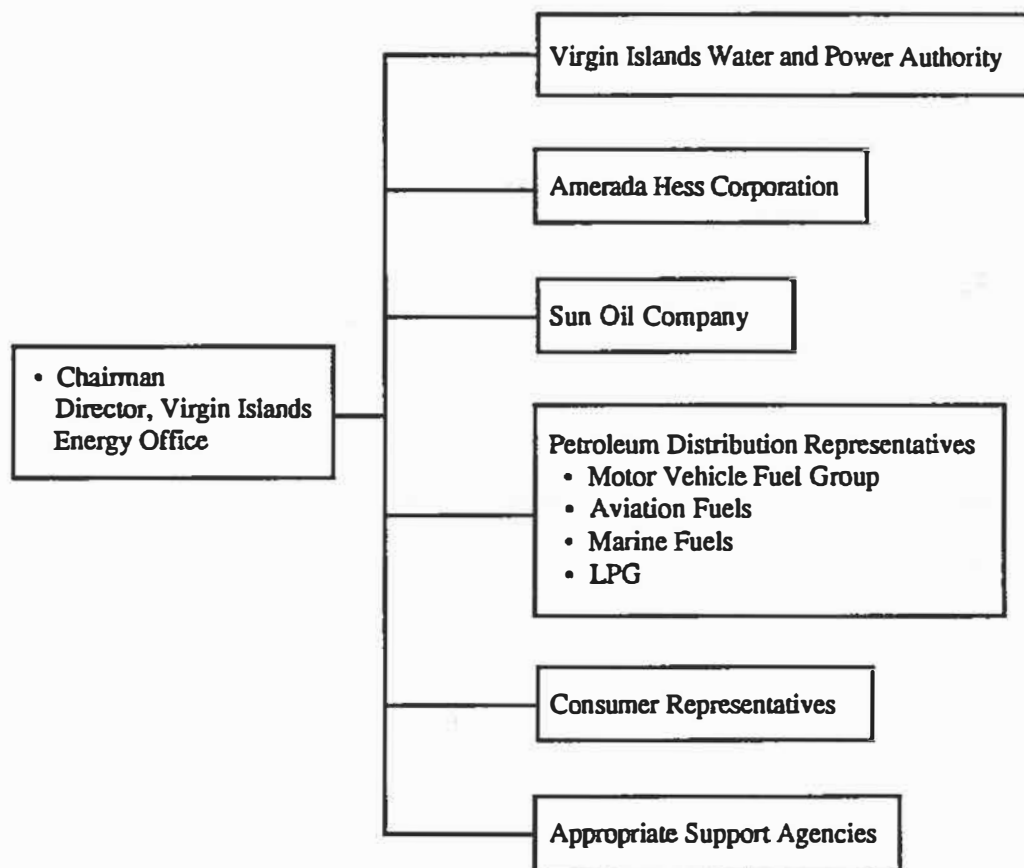
## 2. Public Utilities Commission of U.S. Virgin Islands

The primary mission of the Public Utilities Commission (PUC) is to supervise rates and service and to provide safety regulations to energy providers within the Territory.

**a. Petroleum Management Team**

The Petroleum Management Team is activated in the event of a disruption in the supply or price of petroleum. It is chaired by the Virgin Islands Energy Director, and consists of representatives from WAPA, Amerada Hess Oil Company, Sun Oil Company, petroleum distributors and vendors, consumers and other agencies, as may be considered appropriate. Because of the various fuels, energy needs and consumers involved under the Petroleum Management Team's scope of service, the Team's composition is subject to change, depending upon the emergency. The components of the proposed Petroleum Management Team are illustrated in Figure 5.

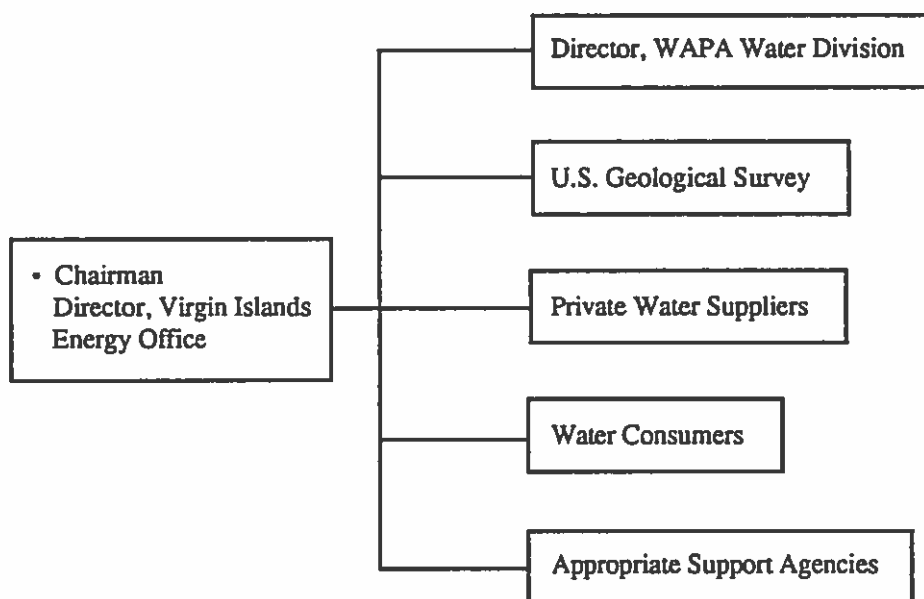
**FIGURE 5**  
**Proposed Virgin Islands Petroleum Emergency Management Team Composition**



### c. Water Management Team

The Water Management Team is activated any time the public water supply to the U.S. Virgin Islands is at risk. In addition, this group meets on a semi-annual basis to address the on-going goal of improving overall system reliability, capacity and safety via improvements to the infrastructure and storage network. This team is chaired by the Director of the Virgin Islands Energy Office and consists of the Director of WAPA's Water Division, a representative of the U.S. Geological Survey, private water suppliers, water consumers and appropriate support agencies. The proposed Water Management Team is illustrated in Figure 7.

**FIGURE 7**  
**Proposed Virgin Islands Water Emergency Management Team Composition**



## CHAPTER III

### ENERGY EMERGENCY PREPAREDNESS PLANNING CONCEPTS

#### A. Defining an Energy Emergency

An energy emergency situation occurs "when there is an incongruity between the supply of and demand for a fuel or set of fuels for particular end uses or in certain sectors." (*Preliminary Considerations for State Energy Emergency Planning*, Oak Ridge National Laboratory, p. 17.) There are two major factors in the definition of an energy emergency: (1) sudden and dramatic supply decreases and (2) sudden demand increases. Essentially, it is the *magnitude* of the difference between supply and demand that defines an energy emergency situation.

Energy emergencies can be defined in three categories: (1) physical destruction of all or parts of the energy infrastructure caused by hurricanes, tornadoes, floods, earthquakes or sabotage; (2) a sharp, sudden escalation in the price of energy which could result from a curtailment of energy supplies from abroad; and (3) a national security emergency and a mobilization of defense resources, creating a sudden surge in demand for energy. (*Regional Differences, Common Concerns*, Strom Thurmond Institute, p. 3.)

Most states and territories define an emergency as an event, shortage, disruption or distribution problem that threatens or jeopardizes the health, safety or welfare of its citizens, threatens the availability of central services or disrupts economic sectors. (*Preliminary Considerations*, p. 17.)

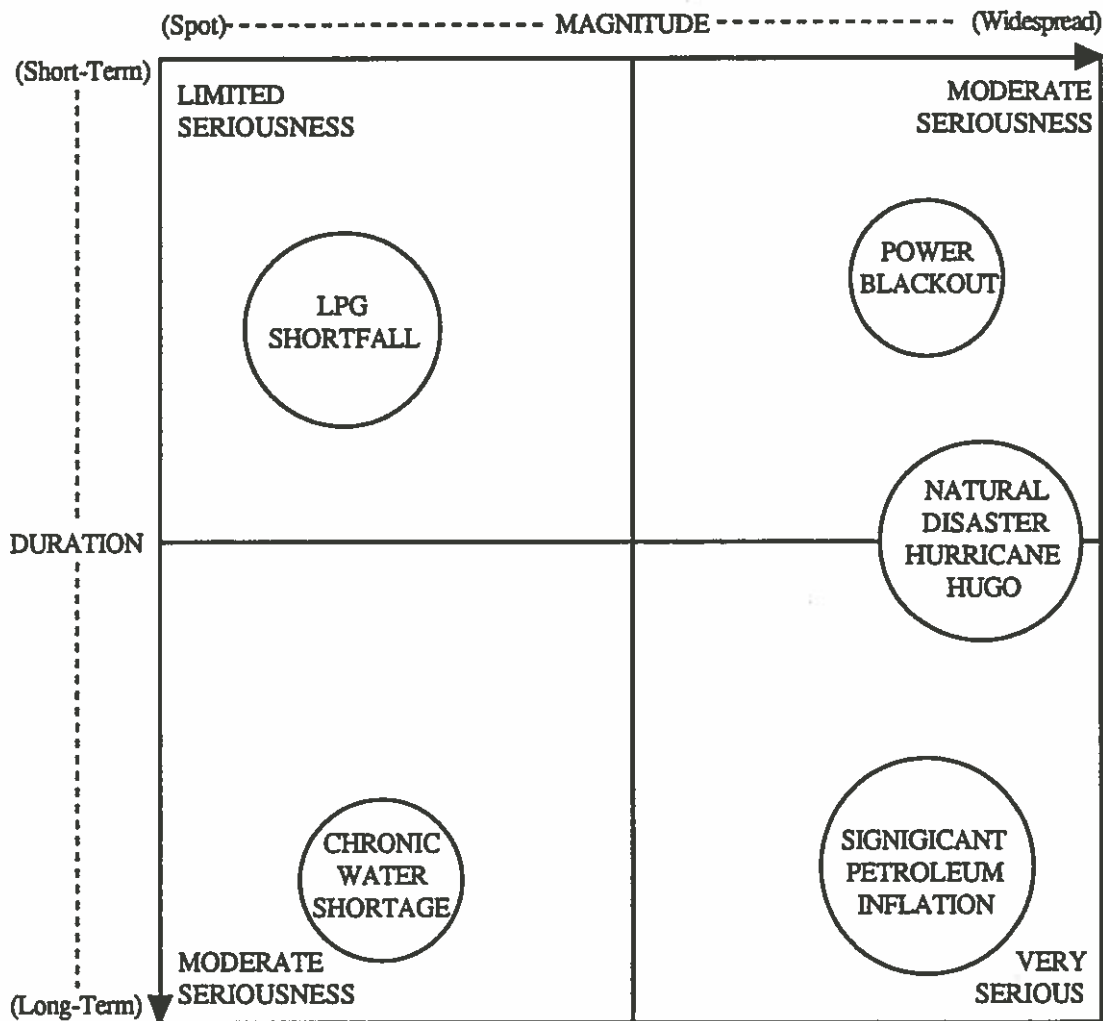
In the *Energy Policy and Conservation Act (EPCA)*, an energy emergency is defined simply as a "severe energy supply interruption." Such an interruption is further defined as a *national energy supply shortage* which the President determines:

1. Is, or is likely to be, of significant scope and duration;
2. May cause a major adverse impact on national security or the national economy and
3. Results, or is likely to result, from an interruption in the energy supplies of the United States, including supplies of imported petroleum products, or from sabotage or an act of God.

Factors defining energy emergencies are:

1. Cause;
2. Extent of the shortage;
3. Energy source;
4. Distribution of the shortfall/shortage among consumers;
5. Perception of the public;
6. The time of year;
7. Nature of the energy use system;
8. Nature and capabilities of the energy distribution system transmission and generation (especially infrastructure);

**Figure 8**  
**Energy Emergency Classification Matrix**



Source: Economic Research Associates, *Considerations for Energy Emergency Planning* (draft), 1989

### B. Establishing Planning Objectives

The challenge in energy emergency preparedness planning is "to develop prudent energy policies and strategies to avoid or prevent future energy emergencies, while at the same time developing programs and response measures to deal with energy crises should they occur." (*Regional Differences, Common Concerns*, p. 3.)

To meet the needs and concerns of affected parties, all goals, objectives and policies under consideration should be thoughtfully assessed in light of their impacts on each other as well as on those in existence. It is likely that potential conflicts will be identified during the process, necessitating the establishment of priorities for various services and functions and the determination of acceptable tradeoffs and compromises among the range of existing and prospective goals, objectives and policies.

## **2. Research and Statistics**

The VIEO is responsible for collecting, organizing and reporting data relevant to energy emergencies, including the kind of fuels, amount of supply, amount of actual flow, demand and price.

The data collection and analysis within the VIEO should be used to monitor supplies and use of electricity as well as petroleum activity as part of its ongoing responsibilities, routinely exchanging information and data with the Public Utilities Commission. During an energy shortage, the existing monitoring systems would be supplemented with additional emergency information gathering mechanisms to provide an accurate basis for implementation of appropriate Territory emergency response programs. By monitoring specific indicators, the Territory will be better able to assess the impact of any potential or existing shortage of petroleum, water or electricity.

## **3. The U.S. Virgin Islands Energy Consumption Database**

The *Energy Profile of the U.S. Virgin Islands* is a technical report prepared by the Economic Research Associates for the VIEO. This report presents the energy consumption and supply patterns with a comparison of Hawaii, a similar area. It includes an assessment of the resources available as well as a breakdown of use by sectors in the Territory.

The U.S. Virgin Islands is included in the U.S. Department of Energy's Federal Energy Data System which collects information on energy consumption, expenditures and prices by economic sector and fuel type; however, this information is combined with energy data from Puerto Rico without any specific analysis of the U.S. Virgin Islands. Thus a database, which includes information dating back to the early 1960's as other states have compiled, is not available. However, information obtained from such sources as the Governor's report to the Secretary of the Interior provides some data prior to 1979 and the Virgin Islands Water and Power Authority has information available dating from 1979 through 1987. Information from other secondary sources such as the Department of Energy and the Bureau of Internal Revenue also contribute to the development of the VIEO database.

The profile of the energy use and consumption trends is updated annually for the U.S. Virgin Islands so that the energy emergency plan may be updated according to changes in need and available resources. This information is kept in a database maintained by the VIEO.

## **4. The U.S. Virgin Islands Energy Use Trends**

The U.S. Virgin Islands, basically without any form of fossil fuel resources, is totally dependent on imported petroleum for meeting its energy demands. Ninety-nine percent of the energy consumed is comprised of petroleum products with over 95% of this energy being obtained from Amerada Hess Oil Refinery, and the remainder from Sun Oil Company. The Territory is in an even more compromising position because this fuel is needed for desalinating 75% of the potable water. It is important to examine the present standing and recent trends in energy supply in the U.S. Virgin Islands for consideration in an energy emergency.

While in 1986 almost 100 million barrels of crude oil were imported, only 10% was used in the Territory. Amerada Hess Corporation is the largest refiner of crude oil in the western hemisphere and exports approximately 88 percent of its processed oil. While 10.8 million barrels are retained in the U.S. Virgin Islands, after normalizing this data for the bunkers and unusually large consumers, only 4.8 million of this is used in the islands. The breakdown is as follows: 30 percent is expended by the Virgin Islands' Water and Power Authority, 50 percent of the normalized Territorial consumption is tied to land, water and air transportation and the remaining 20 percent of the energy is consumed by the residential, commercial and industrial sectors.

Historical information regarding petroleum trends in the U.S. Virgin Islands is generally not available. However, the price has largely followed the changes in crude oil prices. Even after making adjustments for changes in consumption, expenditures increased sharply following the rise in crude oil prices from 1973 to 1975. A second price and expenditure surge occurred between 1978 and early 1981. Beginning in 1981, the Territory benefitted from lower petroleum prices which remained within the price range of \$15 to \$18 per barrel until the August, 1990, Iraqi invasion of Kuwait which sent prices soaring upwards of \$35.00 per barrel and caused wide variations in gasoline prices among the islands.

#### **b. Electricity Usage Trends.**

Between 1970 and 1980 the sale of electricity grew rapidly in the U.S. Virgin Islands. Total sales increased 5.4 percent per year driven by an average growth of 6.8 percent growth in industrial demand and 5.7 percent growth in residential sales. Increases in commercial sales during the 1970's averaged only two percent annually. The trends in these three sectors are largely a response to the industrial development that occurred in the 1970's. Between 1980 and 1987, the growth in overall sales flattened to three percent annually. In this period, sales in both the residential and industrial sectors fell to less than 2.5 percent, yet demand in the commercial sector rose almost six percent each year. These numbers reflect the expansion in the commercial sector related to growth in the tourism industry and weaker economic activity within the industrial sector.

Since 1986, electricity sales reflect explosive growth with overall sales increasing 10.6 percent between 1986 and 1987. The growth between these two years was driven by a 16 percent increase within the industrial sector and an 8 percent growth within the residential sector.

The price of electricity has been largely shaped by two factors. The first is the price of fuels associated with the production of both water and power. The second is changes in the overall efficiency of producing power and water.

#### **c. Potable Water Usage Trends**

Potable water supplied from groundwater wells has remained stable since the 1980's, but its share of total demand in recent years has declined. Water derived from cisterns and roof catchment systems has tended to follow the general growth in buildings within the Territory.

With a large amount of building activity occurring in the decade of the 1980's, the total capacity from roof catchment/cistern systems has increased. As with groundwater supplies, however, its total market share of demand has decreased.

Trend data on the growth of private water desalination is not available. Therefore, the changes in Territorial water demand can best be evaluated by reviewing trends in water sales by the Water and Power Authority (WAPA). During the 1980's, WAPA water sales have increased substantially.

Total water sales jumped from 453 million gallons in 1980 to 1,656 million gallons in 1987 -a 265 percent increase. During this same period, the Territorial population grew by only 10 percent. At the same time, the Gross Territorial Product (as measured in constant 1982 dollars) expanded by only 16.2 percent.

The bulk of new demand for water occurred between 1981 and 1982. Smaller increases occurred between 1982 and 1984, and between 1985 and 1987. Part of the reason for these growth periods is the increased population base. Most of the increase in water sales, however, is the result of a rise in the per capita water consumption. In 1980, WAPA's average customer purchased 4,693 gallons of water. By 1987, this figure rose to 15,625

to the Territory decision makers and to the public regarding the nature of the problem and the methodologies which may be adopted to adjust to changing conditions. Emergency data collection systems should be extensions of pre-crisis database collection systems, as new systems are not easily set up in an emergency, nor would a new system grant the proper understanding of a problem considered out of the context of a baseline. Additionally, Territory budgetary limitations and procedures should be considered so as not to inhibit the implementation of any new data collection system.

The mechanisms for data collection and analysis should include guidelines for access by the appropriate groups and individuals. Alternatively, as emergency updates and analyses are completed, they could be circulated to confirm distribution lists, including key individuals and agencies involved in the emergency response.

## **11. Forecasts and Energy Demand Models**

Past experiences are sound guides for future action, just as assessments of vulnerabilities allow planners to forecast the potential for future problems, where they will occur, their duration and their costs.

Where there is the capability to do so, planners can beneficially build models that will predict energy shortages, project response measures and their impacts, and provide a reliable set of indicators on which to rely in assessing the probabilities of energy shortages. Such models also can aid decision making during actual emergencies.

An important tool to measure the impact of energy disruptions are statistical models of energy demand and forecasts of supply and demand factors. Such projections can be used as a baseline over which to gauge changing conditions, to permit the adequacy of supply and any weakness in the distribution system to be examined, to identify potential supply problems and help warn of the potential need for contingency actions. For example, a demand forecast for motor gasoline can be compared with supply projections from the major oil companies. While this does not indicate on an absolute scale the value of supply defects or shortfalls, it is an indicator of the stress placed on the distribution systems. Another tool might be an electric load forecast which, based on average cooling degree days, can be compared with an adjusted forecast based on recent actual and near term cooling degree day projections in order to measure how much demand is above normal. The projection also permits the problem to be more readily explained to the public. For example, if distillate inventories are projected to equal 25 days of the average monthly demand based on historical data, the degree to which inventories fall below that level give an indication of the degree of shortfall or added demand.

The projection can be prepared using various statistical methods used for the analysis of time series data. Desktop computers have adequate capacity to handle most data series using any one of a number of statistical software packages. It should be noted that some statistical software is specifically designed for time series analysis and modeling. Software intended for cross tabular analysis may not have adequate capability to examine time series data.

For most short-term forecasts (monthly data projected for one year), multiple linear regression and seasonal analyses are usually sufficient. This process would involve developing projections of explanatory variables upon which the demand or supply projection would be based. Such variables could include price, consumer price index, personal income, average vehicle fleet, miles per gallon (MPG), vehicle miles traveled and other measures of economic activity in the U.S. Virgin Islands. Gasoline and diesel fuel projections are sometimes done as part of revenue projections for motor fuel taxes. These projections can also be another source of useful data.

Electric utilities prepare short-term forecasts for operational purposes and as part of various proceedings before the Public Utilities Commission. These forecasts can be used in place of independently developed forecasts. By taking the sum of the utility forecasts, an overall Territory perspective can be developed. These utility forecasts have the advantage of

all jobbers and distributors involved with the sale and distribution of gasoline, distillate and other petroleum products that are sold in bulk.

The procedure for monitoring under an emergency is threefold: (1) monitor the situation, (2) brief the applicable Energy Management Team and (3) make recommendations to the Governor who will then take the appropriate action. The Governor and those involved in the decision making process will select from response measures that may be used alone or in combination to ensure that the Territory's response is as flexible and sensitive to conditions as possible. To ensure flexibility, this plan includes broad stages of response to increasingly severe shortages. The process of implementation may be summarized in terms of three stages: Level I, oil shortage alert; Level II, moderate shortage; and Level III, severe shortage. These levels are defined in the operational section of this plan.

The severity of a fuel shortage can be estimated by reference to various indicators, but to accurately quantify a shortage in terms of percentage of shortage is very difficult. One significant indicator is the supply available to the Territory; however, due to the various supply arrangements, distribution systems and local use rates and patterns, some communities may experience more problems than others. Thus, during a very mild Territory-wide shortage, localized areas might experience substantial problems. For this and other reasons, it is not practical to tie the phases of a flexible energy emergency plan to specific percentage shortage levels. The categories of energy emergencies are presented to supply an additional description for use by Territorial decision makers.

#### **b. LPG**

Liquid Petroleum Gas (LPG) is used for cooking and water heating which is important for sanitation and processing activities. This is not only important for residential use but also needed to maintain hotels which contribute to the economically important tourism. LPG price and consumption can be monitored through dealers. Normal seasonal fluctuation of the sales of LPG should be factored into any analysis.

#### **c. Electricity**

The centralized nature of the electrical distribution system, with two major systems on three islands, makes the monitoring of electricity considerably easier than monitoring the petroleum distribution. Contacts with the Water and Power Authority provide most of the necessary data regarding systems conditions. Emergency electrical notification procedures adopted under the guidance of the North American Electric Reliability Council (NERC) provide the information that would be required in an emergency condition. However, the monitoring database might contain data including: (1) electricity sales, (2) levels of fuel available for the generation of electrical power, (3) generation capacity and plant availability, (4) regional system reliability forecast and (5) cooling degree days.

- (i) **Levels of Fuel Inventories Available for Generation**—Levels of fuel inventories should be reported in terms of the number of days of supply on hand at each location for oil-fired plants.
- (ii) **Generation Capacity and Plant Availability**— Sources for this information include the *Inventory of Power Plants in the United States*, published by the DOE/EIA, and reports submitted to the Public Utilities Commission by utilities of the respective service district regarding power plant outages and planned maintenance outages.
- (iii) **Regional System Reliability Forecast**—NERC publishes annual reports of regional system reliability. This report makes an assessment of the reserve margins, comparing net system availability with peak load projections and system pool reserve availability.

In an energy crisis, an Energy Emergency Center (proposed), operated by the VIEO staff in conjunction with the other Territorial agencies, can serve as the primary location for the assembly and dissemination of information concerning the energy shortage. In this center, information can be filtered and provided for the Governor's press conferences and pre-emergency kits can be prepared for the public. The Energy Emergency Center should be equipped with conventional telephone and computerized electronic communications systems with telephone hotline capabilities. The Energy Emergency Center should be linked with the U.S. Department of Energy and the energy offices of the states through the DIALCOM electronic mail system.

A recent draft of the *Guidelines for State Energy Emergency Preparedness* prepared by the Strom Thurmond Institute at Clemson University, describes how a state or territory's energy emergency public information program might be carried out. In the context of the U.S. Virgin Islands, the program could be designed as follows:

**a. Objectives:**

- (i) To provide citizens with accurate and timely information on the scope, nature, severity and possible duration of the energy emergency;
- (ii) To provide effective visible leadership from the highest levels of the Territory's government in order to encourage voluntary compliance with emergency measures and to reduce panic response to the emergency;
- (iii) To provide information to the public on the location and availability of energy supplies and Territorial government activities in managing the emergency situation and
- (iv) To establish ongoing communications with:
  - Other agencies within the Territory which have support responsibilities during an energy emergency,
  - Agencies within the Territory which have the task of implementing programs and providing citizens with information on implementation of response measures,
  - States which share an energy interdependency and whose actions may directly impact each other and
  - Federal government agencies, such as the U.S. Department of Energy and the Energy Information Administration, which can provide information to assist in evaluating the crisis.

**b. Program Description**

An effective emergency response plan involves continuous coordination and two-way communication with all levels of government, private industry and the public. Therefore, it is necessary to have the personnel, equipment, facilities and procedures which will allow the Virgin Islands Energy Office (VIEO) to function as the central clearinghouse for gathering and disseminating energy information during an emergency through appropriate channels with the Governor's Press Secretary.

**c. Implementation**

The public information program will be automatically implemented when the Governor declares that an energy emergency exists. The energy emergency public affairs program will be coordinated by VIEO, working with the Governor's press and public affairs staff.

- b. **Verify information before release.** Be cooperative with the media, but avoid giving out incomplete or unchecked news. Consider using regularly scheduled meetings with the press to relieve the pressure to answer questions on the spot.
- c. **Prepare information packages.** Handouts at press conferences and prepared statements for broadcast appearances on the energy emergency's history, background, technical terms and pertinent energy data will contribute to accurate, thorough reporting. Develop sample press kits with as much information as possible in advance.
- d. **Provide factual information.** Use the national level information available from DOE to describe what external energy forces such as international markets, shipping, transportation, accidents and weather are affecting the Virgin Islands' energy situation. Also, get opinions from industry experts about the emergency and how serious it is perceived to be. Develop accurate data and information. To obtain consistency use only one spokesperson for dealing with the news media, and only one centralized point for issuance. Also ensure that government officials are receiving at least as much information as the news media.
- e. **Use caution in providing official conclusions.** Energy emergencies are usually caused by very complex factors, and experience has shown that public opinion can be easily swayed by fragmented information and opinions. Attempts should be made to be neither overly conservative nor rash when preparing summaries or determinations.
- f. **Use media specialists with an understanding of the energy situation.** The effort must be staffed by personnel skilled in dealing with the news media, with a knowledge of the key energy issues and with an understanding of the various aspects of the emergency.
- g. **Work with key policy level officials.** Be able to obtain access to key policy making officials and experts from various Territory agencies to answer substantive questions from the media.
- h. **Assist the news media to inform the public.** The public affairs effort should assist the media in presenting authoritative, accurate and timely information in order to avert panic or the spread of rumors.

## **16. Equipment Requirements**

The equipment needed should be identified ahead of time and be made available through VIEO, loaned from other Territory agencies or obtained through purchase or rental at the time of the emergency. Key equipment requirements involve:

- a. A telephone system with the ability for easy expansion, including public information numbers and private lines for communicating with VIEO, the Governor, legislators, the media and the public;
- b. Computers with modems using electronic mail or DIALCOM which can be used to communicate with DOE and with other states;
- c. Computers with modems to provide a means of rapidly obtaining large amounts of energy information, data and important news coverage through wire services and
- d. Cellular telephones and facsimile machines which are also necessary for emergency response.

## **19. Use of the Electronic Mail System**

Viable communications are an integral part of emergency preparedness. If needed, DIALCOM can be used as an early warning system for reporting potential Territorial or area supply shortages and verifying local supply situation reports received by the Federal government. State/territory energy offices should use DIALCOM in an emergency to routinely relate and provide an assessment of the energy supply situation in the U.S. Virgin Islands to the Department of Energy and the states. In addition, Michigan's Electronic Mail and Bulletin Board System provides another valuable tool to keep state and territorial energy offices, the Governor's Offices and the media updated on developing events.

## CHAPTER IV

### ECONOMIC ASSISTANCE PROGRAMS IN THE U.S. VIRGIN ISLANDS

#### A. Social Issue

Energy emergency plans should be evaluated in terms of their social impact as well as their technical and economic adequacy. In addition, there should be coordination of appropriate agencies that have existing mechanisms for providing economic assistance to low-income households in times of energy shortages.

Economic assistance in times of energy emergencies is not a programmatic part of Federal energy policy. Instead, it is social policy for which responsibilities lie with other agencies at the Federal and Territorial levels of government.

At the Territorial level, economic assistance in energy emergencies may be a part of the U.S. Virgin Islands energy policy, or it may be attended to by other agencies in cooperation with the Virgin Islands Energy Office.

#### B. The Nature of the Issue

Now that fuel markets have been deregulated, any energy shortage is likely to produce increases in fuel prices. Higher fuel prices will place burdens on low and moderate income citizens.

#### C. Remedies

The following are remedies to be considered by VIEO in dealing with hardships created by scarcities of supply and higher energy prices.

1. **Liaison with Social Service Agencies.** In a fuel emergency, VIEO will receive calls from low- and moderate-income citizens unable to obtain water and power at crisis-level prices. Hence, it is vital that an up-to-date list of the Virgin Islands' social service agencies (with telephone numbers) be maintained. VIEO should establish working relationships with social service agencies during *non-crisis* periods and maintain these contacts in anticipation of energy emergencies when their assistance is needed.

The Virgin Islands Department of Human Services operates a low-income energy assistance program to help qualified applicants in payment of WAPA charges. VIEO should coordinate with this department.

2. **Mandated Relief.** Some states have laws which require utilities and other fuel delivery companies to continue deliveries to low income residents during crisis periods whether or not these residents can pay. VIEO should be familiar with such laws and how they might be applied.
3. **"Jaw-Boning" and Industry Liaison.** VIEO may wish to establish liaisons with fuel companies before the onset of any shortage for the purpose of working out informal ways of dealing with the effects of sudden price increases. The objective is to elicit voluntary actions from the energy industry that will help mitigate severe economic dislocations for residents.

## **CHAPTER V**

### **TRAINING AND EXERCISE PROGRAMS**

#### **A. Introduction**

The effectiveness of an energy emergency plan relies upon the ability of the staff to implement the required actions and mechanisms. Training to develop and enhance the requisite skills and performance levels is a continuous task. The energy emergency staff should have a comprehensive training program to prepare for energy disruptions. Training, practice and exercises are the keys to effectively carrying out the responsibilities and professional duties that an energy emergency will demand.

This concept of practice and training is an important mechanism for understanding the resources and capabilities that will be required in an energy emergency. Exercises and simulations will tie the skills and tasks together in the process of decision making under extraordinary circumstances. The following sections of this chapter will discuss the training and exercise programs that can be used in support of the U.S. Virgin Islands Energy Emergency Plan.

#### **B. Contingency Planning Exercises and Simulations**

A contingency planning program that uses exercises and simulations has a number of inherent benefits: it allows the staff to grapple with key policy issues; it provides an opportunity to practice crisis decision making in a "risk free" environment; it encourages the establishment of important interpersonal networks and it aids the staff in focusing on the critical information, data and communications requirements that are needed to make accurate situation analyses and support the crisis managers.

The exercises and simulation program have five objectives:

1. To support the continuing development and maintenance of the U.S. Virgin Islands Energy Emergency Plan;
2. To enhance the development and effectiveness of the pre-emergency monitoring methods as well as the various emergency response mechanisms;
3. To identify shortcomings in the plan's response strategies and determine corrective actions;
4. To establish the necessary level of preparedness and acceptable risk consistent with available resources and
5. To train and maintain the applied skills of the staff involved in the Territory's Energy Emergency Plan.

These planning exercises can range from simple "table top" seminars to large scale emergency simulations involving extensive numbers of people, taking place over extended periods of time and dealing with severe energy disruptions throughout the Territory. An annual program plan for conducting and scheduling exercises should be developed as a means for training. Additionally, VIEO participation in regional and DOE energy emergency exercises and simulations is an ongoing part of energy emergency training and preparedness.

#### **C. Interagency Training**

Other agency and departmental activities of emergency preparedness will provide coordinated intergovernmental training. Of particular interest will be the training conducted by the Virgin Islands

## **CHAPTER VI**

### **FEDERAL ROLES AND RESPONSE MECHANISMS TO ENERGY EMERGENCIES**

The goals of the U. S. Department of Energy's emergency preparedness program are to reduce the nation's vulnerability to energy supply disruptions and to enhance the nation's ability to respond to a disruption should one occur. It is also the stated policy of the Federal government that (1) states/territories should bear the major responsibility in formulating contingency plans to mitigate their energy shortages (cooperating on a regional basis and coordinating with the Federal government), (2) market forces should be allowed to function as the most ideal method of allocating scarce supplies and (3) government and industry should cooperate in every appropriate way to ensure stable energy supplies at stable prices.

#### **A. Federalism and State Initiatives in Contingency Planning**

States and territories are regarded as the proper authorities to plan for energy emergencies and to take the necessary initiatives (short of a national emergency) to resolve energy shortages, with their plans thereby reflecting their own unique circumstances and needs.

#### **B. The Free Market Principle**

The present administration advocates a free market approach to energy emergencies, as opposed to intervention policies, such as price controls and allocation. The current policy is based on the principle that the market, which is most efficient during non-crisis periods, also serves as the best allocator during supply disruptions, even severe disruptions.

Due to its reliance on a flexible, decentralized response, the market strategy is better able to deal with the uncertainties and irregularities posed by an energy emergency. The length and severity of a disruption is usually not known at the outset, and the impact of a disruption is not uniform across economic sectors and geographic regions. The free market strategy accommodates these uncertainties by allowing energy consumers to make autonomous decisions based on individual situations.

In addition, an unregulated response strategy that relies on prices allows the private sector greater latitude to prepare for emergencies and to act independently during any disruptions that may occur. Refiners, distributors and end-users now have greater incentives to diversify their supply sources or maintain adequate petroleum stocks, since they know that the government will not allocate supplies and institute cumbersome regulations during disruptions. Similarly, utilities and industrial oil users in many cases have found it advantageous to install multi-fuel capacity for use during periods of high oil costs and limited fuel availability.

While committed to the principles of the free market, DOE appreciates the role the Federal government will have to play in the event of a major oil supply disruption. That role, however, will be significantly different than the one the Federal government played during the supply crises in the 1970's, when the government assumed the burden of attempting to regulate petroleum prices and to allocate its supply throughout the nation.

#### **C. Free Market and Government Responses During an Energy Emergency**

There are circumstances in which market mechanisms *cannot* react in an effective and timely manner to serve critical needs, especially among the low-income population. Thus, in extreme situations where the public health and safety are threatened, states and territories must take steps to deal with these needs.

5. **Foreign Oil Production.** During an oil disruption, market conditions would be conducive to unaffected producer nations to increase their petroleum production. Consuming nations can also be expected to remove trade barriers or economic disincentives which would impede the flow of oil from these sources.

DOE monitors the available excess production capacity of other producing nations, in order to estimate how much of that capacity could mitigate the size of an oil disruption. Higher oil prices resulting from a petroleum supply disruption are expected to stimulate production by producer nations with excess capacity. Free world excess production capacity is estimated at 8 to 9 million barrels per day. Outside the Persian Gulf the excess capacity is estimated at 2 to 2.5 million barrels per day. Producer nations such as Nigeria, Algeria and Venezuela, to name a few, have significant spare production capacity that most likely could be quickly brought to full output levels.

While some countries may increase production, past experience has shown that for a number of reasons (social, political, economic) many nations may not increase production during an international shortfall or, at best, they may not increase production to maximum sustainable levels. It is very likely, for example, that some producer nations may perceive a prolonged supply disruption and therefore withhold any increase in production in anticipation of higher prices. Additionally, technical problems may prevent the entire amount of spare capacity from being realized. After a time, equipment deteriorates and fields lose natural pressure to bring oil to the surface, so expensive and time-consuming techniques are necessary to bring production up to capacity.

As previously stated, Amerada Hess, from whom the U.S. Virgin Islands obtains most of its fuel, is not as susceptible to variations in oil production because of its ability to obtain oil from both domestic and foreign producers. While there may be some effect on the production by Hess and the price of petroleum will be increased, the effects will not be as dramatic to the U.S. Virgin Islands as might occur elsewhere.

#### **D. Office of Energy Emergencies**

Executive Order 12656 (November 18, 1988) assigns energy emergency preparedness responsibilities within the Federal government. It assigns to DOE major responsibilities for policy making and a coordinating role within the Federal government for energy emergency preparedness planning and strategy. Within DOE, the Office of Energy Emergencies is the unit which carries out this responsibility.

The organization of OEE is shown in Figure 9. Three offices report to the Deputy Assistant Secretary for Energy Emergencies. The *Office of Energy Emergency Policy and Evaluation* (OEEPE) monitors, evaluates, incorporates and disseminates energy emergency initiatives and developments in support of the OEE preparedness mission. The *Office of Energy Emergency Plans and Integration* (OEEPI) develops energy emergency response plans that include using the Strategic Petroleum Reserve (SPR) and strengthening commitments to the International Energy Agency (IEA) and the North Atlantic Treaty Organization (NATO). The *Office of Energy Emergency Operations* has the responsibility to make sure that the U. S. infrastructure (industry, state, territory, and local governments) is able to meet national priorities in the event of catastrophic and defense-related energy emergencies.

OEE focuses attention on the vulnerabilities of four domestic energy systems: electric power, oil, gas and coal. The nature and extent of domestic and international threats to energy security determine how OEE will carry out its emergency preparedness activities.

In normal times, OEE monitors domestic and international energy events and conducts studies and training exercises. DOE's response to energy emergencies involves general and operational planning, procedures, budgets and human resources.

**FIGURE 10**  
**EEMT Membership**

| Core Group                                                   | Augment Group                     |
|--------------------------------------------------------------|-----------------------------------|
| International Affairs and Energy Emergencies                 | Petroleum Reserves                |
| Congressional, Intergovernmental,<br>and Public Affairs (CE) | Fossil Energy (other than PR)     |
| General Counsel                                              | Nuclear Energy                    |
| Defense Programs                                             | Conservation and Renewable Energy |
| Energy Information Administration                            | Environment, Safety and Health    |
| Management and Administration                                |                                   |
| Policy, Planning and Analysis                                |                                   |
| Office of the Under Secretary                                |                                   |

Source: U.S. Department of Energy, Office of Energy Emergencies

As the Federal government monitors and moves into an energy emergency situation, it uses EEMS. This is significant because the Federal government will include the U.S. Virgin Islands when handling an energy emergency if the Territory is affected by the situation. Run by DEE for DOE, the meeting will most likely be held in Washington, D.C., but the U.S. Virgin Islands will be represented in deliberations.

Throughout its developmental process, the EEMS has been tested in a series of informal intra-departmental workshops, table-top exercises and an international exercise of Coordinated Emergency Response Measures (CERM). The findings of these activities have been used to fine-tune the process and establish a foundation from which detailed operational procedures can be developed. An intra-departmental task group is currently developing these procedures. The *Energy Emergency Operations Manual*, which ultimately will contain operational procedures for all fuel types and categories of potential emergency scenarios, currently contains in draft form the procedures for responding to a disruption related to an international petroleum shortfall. The procedures specify the kinds of activities required by an emergency (e.g., projections of energy supplies, assessments of supply disruption and the resulting impacts and the development of emergency response options).

The EEMS has been designed with a structure that provides an orderly response process with enough flexibility to deal with the complexities of each emergency. The overall EEMS is illustrated in the functional flow diagram, Figure 11. Its activities include:

1. **Monitoring the Energy Situation.** DOE staff monitor the domestic and international energy situations, receiving information from a multitude of sources. A staff member is on call to alert senior management to emergency situations which arise during non-working hours. The DOE Emergency Operations Center is the conduit for emergency information and communications;

## **F. Domestic Response Structure**

DOE is committed to maintaining adequate crude oil stocks that can be drawn down in the event of an emergency. Private stocks, coupled with a significant level of public stocks held worldwide, remain the strongest possible deterrent to politically-inspired embargoes and can be a primary defense against the impacts of a supply disruption, regardless of its origins.

The use of petroleum stocks during a disruption is particularly effective because it strikes at the root of the problem—inadequate supply—and thereby prevents oil prices from increasing rapidly. Strategic stockholding is consistent with DOE's overall energy emergency policy because it functions in tandem with the market by enhancing disrupted supplies and does not interfere with the market process by setting falsely optimistic prices. Finally, use of petroleum stocks discourages hoarding in energy emergencies.

In the U.S. Virgin Islands, the government should lease stock from the Amerada Hess Oil Refinery instead of maintaining separate containment facilities, thereby attempting to ensure an adequate petroleum supply.

### **1. The Strategic Petroleum Reserve (SPR)**

Amerada Hess purchases approximately 50% of crude oil from the United States and is eligible to bid for stocks of the SPR according to the existing market pattern. For the Virgin Islands, supply is contingent on the bid prices and the eligibility of the U.S. Virgin Islands in terms of quantity.

#### **SPR Drawdown Policy**

To maximize the value of the SPR, drawdown decisions must be based on estimates of the severity and duration of the emergency, the likelihood of subsequent disruptions and whether there will be opportunities to refill the SPR between drawdowns. Use of the SPR, however, does not replace the underlying principle that the most efficient allocation of oil over time will be made by the market.

The basic policy has been to drawdown the SPR early and in large volumes in response to a supply disruption. Since so many factors, objectives and circumstances must be taken into account in reaching a decision to use or not to use the SPR, DOE will not determine the specific interval and rate of SPR drawdown until a disruption occurs. As with the overall energy emergency policy, it is not appropriate to establish in advance a specific trigger or formula for using the SPR because of the wide range of uncertainties likely to be encountered during an interruption.

The economic benefits of using the SPR stocks in an emergency will be maximized if stocks are drawn down in large volumes early and in coordination with the IEA partners.

While the United States government considers strategic stocks as the first line of defense in deterring or responding to an oil disruption under the IEP, each member is to participate fully in the IEA's Emergency Sharing System (ESS), should it become necessary to implement the ESS in an emergency. In this context, the U.S. National Emergency Sharing Organization (NESO) in DOE would act as the conduit for collecting and reporting petroleum market data and for keeping industry and the IEA informed on the United States implementation of the ESS.

To facilitate use of the SPR in urgent situations, SPR facilities and procedures have been designed to interface with the existing commercial crude oil market. The quality of crude oil stored in the SPR reflects the current market demand for major grades of crude oil. Once a decision is made to draw down the SPR, DOE will function in much the same way as a commercial seller, soliciting competitive bids and awarding contracts. Once sold, petroleum from the SPR is treated like regular commercial crude, using the same domestic pipeline and

The *Merchant Marine Act of 1920*, (known as the *Jones Act*), bars vessels which are foreign built, foreign owned or registered in foreign countries from engaging in United States coastal trade. The provisions of the *Jones Act* may be waived under conditions specified by *Public Law 81-891* in order to permit the use of otherwise unqualified vessels in domestic coastal trade. The specified conditions for a waiver include a determination by the Secretary of the Treasury that the waiver is "necessary in the interest of national defense." Responsibility for *Jones Act* waivers in the Treasury Department has been delegated to the U.S. Customs Service. In adjudicating a waiver request, the Customs Service determines the availability of qualified vessels from the Maritime Administration (MARAD) and the national defense requirement from the Department of Defense. The statute provides that a waiver requested by the Secretary of Defense is automatically approved, whereas approval of a waiver requested by another cabinet or government agency or by a commercial firm is discretionary.

The Customs Service contacts DOE in the case of energy-related *Jones Act* waiver requests. On waiver requests which are necessary to resolve or mitigate a critical energy supply situation, DOE has consistently maintained that the request waivers were "necessary in the interest of national defense", and therefore, DOE has recommended the approval of the requests. The fact that DOE recommends approval of a *Jones Act* waiver request does not ensure that a waiver will be granted. DOE's recommendation, as well as those of DOD and MARAD, are forwarded to the Customs Service where a final determination is made. The Customs Service asks MARAD to advise regarding the availability of United States flag vessels to transport the cargo. MARAD does not consider purely commercial delivery terms-for example, whether or not the shipment is economically vital to the shipper or the consignee-in its availability determination.

*Jones Act* waiver decisions have been made in as little as 48 hours in the past. Typically, however, the interagency review initiated by the Customs Service takes several days, even in emergency situations.

A new Memorandum of Understanding (MOU) among the Customs Service, Treasury Department, MARAD and DOE will identify the specific information needs of each agency, establish a process and time lines to expedite requests and information exchanges and specify findings and recommendations to be made by each agency.

(Source: Office of Energy Emergency Operations, U.S. Department of Energy, May 1990)

## **G. Programs to Meet Defense Petroleum Needs**

One of DOE's key objectives is to ensure that critical fuel supplies reach the military and essential defense industries during an energy emergency. During peacetime, the military oil sector comprises about three percent of overall domestic consumption. During wartime, however, this percentage could triple.

DOE maintains a close working relationship with the Department of Defense (DOD) to ensure that routine fuel needs are fulfilled. During emergencies, DOE has legal authority to meet the unique requirements of the military and essential defense industries.

In the event of a petroleum supply disruption, DOD can take specific steps to acquire additional petroleum resources to support military operations and defense-related industry.

### **1. Waiver of Procurement Provisions**

Under 10 U.S.C. 2404, the Secretary of Defense can waive any Federal statutes regarding the formation of contracts in order to expedite petroleum procurement to support military operational requirements.

## **I. Conservation Programs**

### **1. Institutional Conservation Program (ICP)**

The Institutional Conservation Program administers Federal and Territory grants to provide financial assistance to public and private nonprofit schools, hospitals and public care institutions to make their buildings more energy efficient. The program provides financial assistance to conduct an on-site detailed analysis of all energy consuming systems within a building. These energy audits result in a recommendation of various modifications, retrofits and/or procedures which can be implemented to save energy. Grants are also available on a 50 percent matching basis to fund eligible modifications and retrofits.

### **2. Energy Extension Service (EES)**

The Authority for the Energy Extension Service Program is prescribed in the National Energy Extension Service Act, enacted as Title V of the Energy Research and Development Administration Authorization Act of 1977. This part contains the regulations adopted by the Department of Energy to establish a comprehensive Energy Extension Service Program which shall:

- a. Establish a positive energy outreach program directed toward small businesses and individual energy users and the organizations that influence their energy consumption;
- b. Stimulate, provide for, and supplement programs for evaluation, planning and other technical assistance of energy conservation efforts including energy outreach activities of the states and territories and
- c. Provide financial assistance to the states/territories for plans which contribute to the implementation of the Comprehensive Service Program.

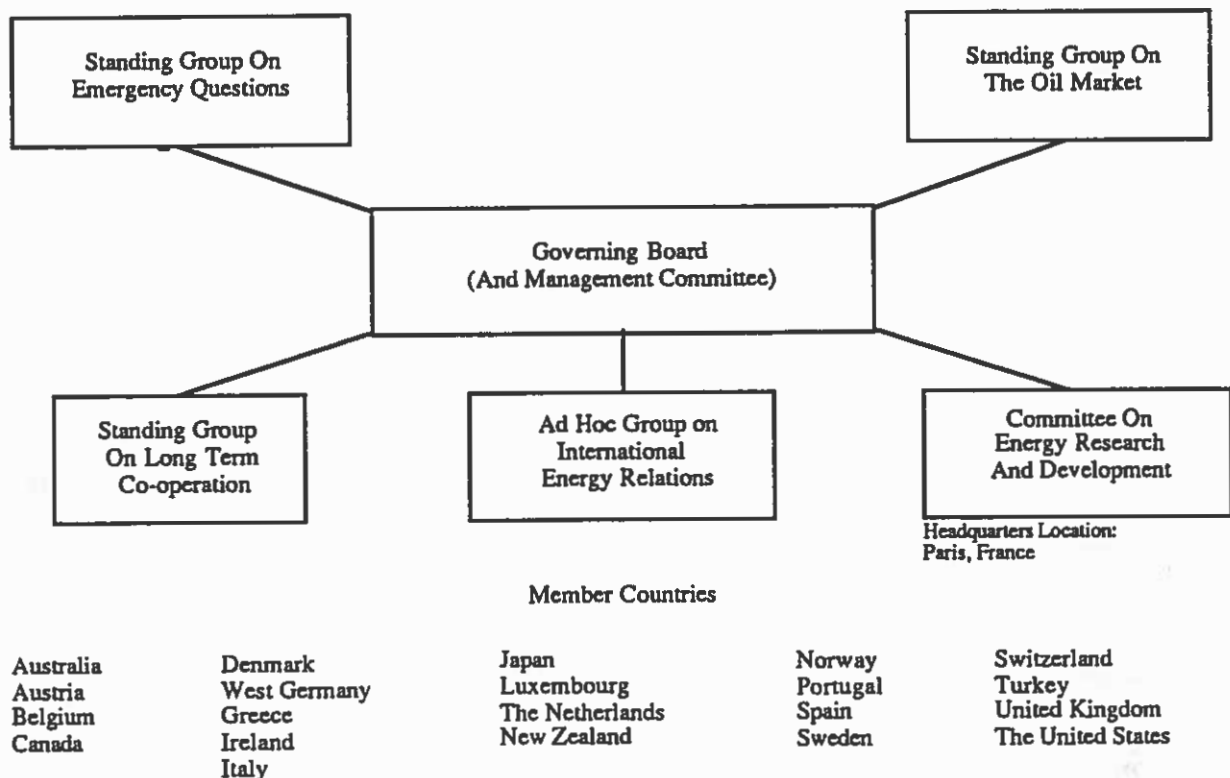
## **J. State Energy Conservation Program (SECP)**

This part of the Energy Policy and Conservation Act prescribes requirements for program measures included in plans and supplemental plans and guidelines for the development, modification and funding of plans and supplemental plans. It is the purpose of this Act to promote the conservation of energy and reduce the rate of growth of energy demand through the development and implementation of a comprehensive state/territory energy conservation plans program and the provision of Federal financial and technical assistance to states and territories in support of such program.

The Department of Energy has the responsibility to foster and promote comprehensive state/territory energy conservation plans by providing technical and financial assistance for specific initiatives to conserve and improve efficiency in the use of energy as well as to encourage the use of renewable resources. Because of the diversity of conditions among the various states and regions of the nation, a wholly Federally administered program would not be as effective as one which is tailored to meet local requirements and to respond to local opportunities.

**Clean Air Act.** During emergencies, state and territorial governors can appeal to the President to lift emissions restrictions on the burning of coal and high sulfur fuel oils to alleviate the effects of an energy disruption. The emergency provisions of the *Clean Air Act* (CAA) were invoked six times in 1978 and twice in 1979. No suspensions have been granted since 1979. The six cases in 1978 were all related to the United Mine Workers strike. Although the Environmental Protection Agency (EPA) had the lead responsibility for the Federal government, DOE was a prominent actor, providing technical information to EPA and state utilities and providing necessary electrical power interconnections.

**FIGURE 13**  
**International Energy Agency Committee Structure**



Source: U.S. Department of Energy

## 2. Emergency Sharing System (ESS).

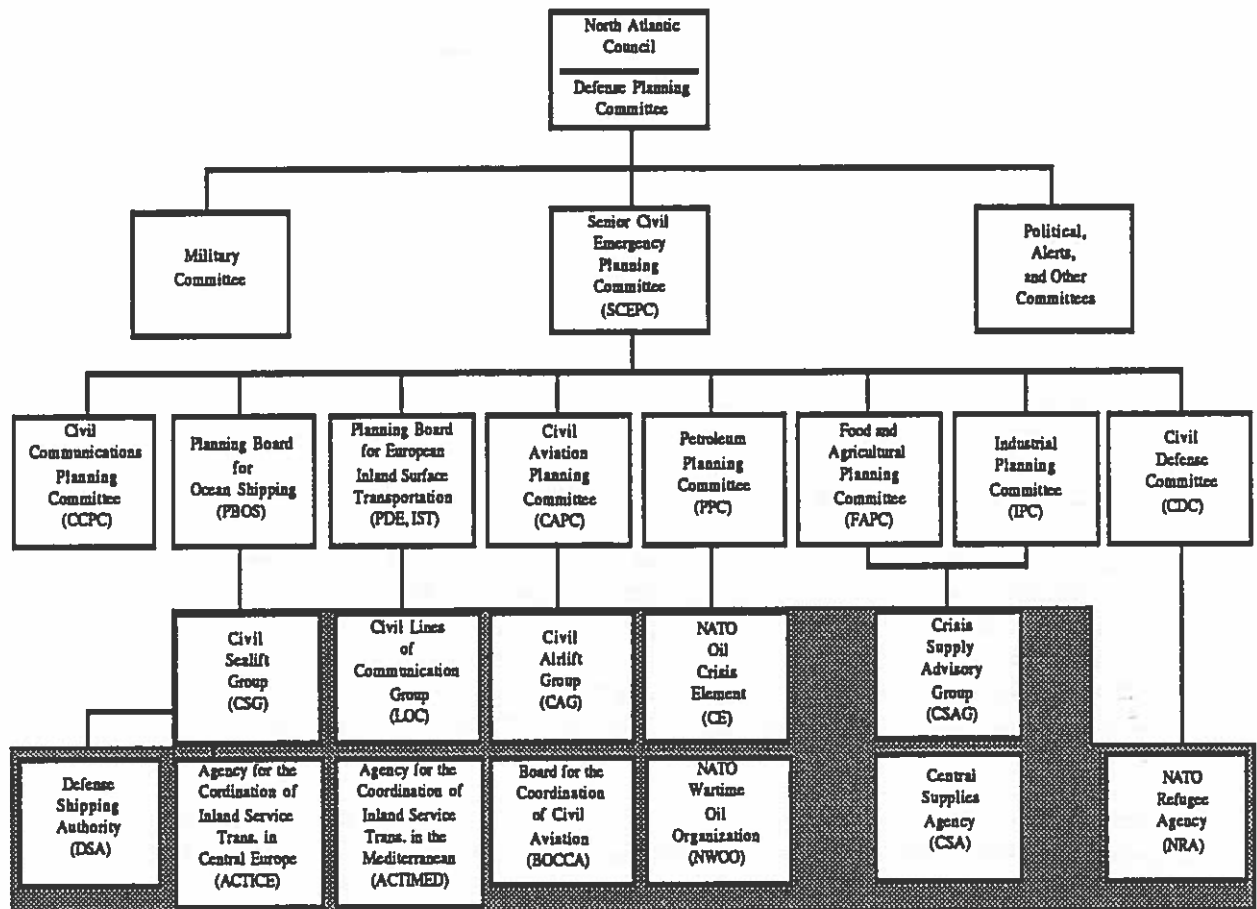
Provisions of the IEA's 1974 Agreement on an International Energy Program established an Emergency Sharing System (ESS) for coordinating responses and sharing supplies among members in a major oil supply disruption. The ESS may be triggered if the IEA or any member country sustains, or is expected to sustain, a seven percent reduction in base period consumption. When the ESS is triggered, the IEA serves a coordinating function to: (1) determine the extent of an energy disruption relative to recent consumption levels in each country, (2) determine the percentage shortfall each country will bear in the disruption and (3) redirect supplies to ensure that all member countries are affected proportionately.

The United States stands firmly behind its commitments to the IEA, although it is generally recognized that the ESS is likely to be cumbersome and that alternative measures such as a coordinated stockdraw should be tried before invoking the ESS.

## 3. Coordinated Stock Drawdown.

One of the alternatives that would likely be pursued during the early stages of a significant petroleum disruption is a coordinated effort by IEA countries to draw on their petroleum stockpiles. The United States continues to stress the importance of building and maintaining high levels of petroleum stocks which can be drawn down in a major oil supply disruption. Recognizing the merits of such an approach, the IEA Governing Board established in 1984 the framework for emergency international consultations for a coordinated IEA/OECD emergency response.

**FIGURE 14**  
**NATO Emergency Planning Structure**  
**Peace/Crisis/Wartime**



Source: Strom Thurmond Institute, *Guidelines for State Energy Emergency Planning* (draft), 1990

## L. Coordination and Communication

Several mechanisms have been established to foster cooperation and enhance preparedness between DOE and other Federal agencies, the states and territorial governments and industry, thus expediting response to energy emergencies.

### 1. Enhancement of the Electronic Mail System

Viable communications are an integral part of emergency preparedness. The DIALCOM system, active since 1981, is a computerized communications network (electronic mail), linking DOE, the states, territories and other selected users. The DIALCOM system can quickly transmit large quantities of written data to addressees and store the data for selective retrieval. This system can transmit messages to a large universe of receivers simultaneously. If needed, DIALCOM can be used as an early warning system for reporting potential state or regional supply shortages and verifying local supply situation reports received by the Federal government.

DIALCOM features include a priority mail system to ensure: the most important messages are received first, high-fidelity hard copy exchanges of information, electronic publishing, forwarding capability of stored information to any user at any time and automatic acknowledgement by time and date of messages received by the user.

Because the states and territorial governments have an important role in all types of energy emergencies, they are often included in this activity. This would provide insights into DOE's emergency preparedness programs and assist further in determining their roles and relationships with the Federal government in the event of an emergency. These exercises would include major regional emergencies such as a major power outage, a severe earthquake or an international oil supply interruption. Participants from the states and/or Territories would be state energy office directors, state/territory emergency services directors, selected regional public interest association representatives and/or selected National Defense Executive Reserves (NDEs).

### **3. Energy Information Administration (EIA)**

The Energy Information Administration (EIA) is the independent statistical and analytical agency within DOE and is therefore a valuable source of information in the process of energy emergency preparedness planning. Within EIA is the National Energy Information Center (NEIC), which makes available information on energy sources, reserves, production, consumption, distribution, imports, exports and related economic statistical information, both historical and forecasted. Users of NEIC include other U. S. agencies, members of Congress and their staffs, state, territorial and local governments, foreign governments and organizations, industry and commercial groups, trade associations, media, libraries and private citizens.

NEIC operates a general access telephone line (with plans in the future for a line for the hearing-impaired), responds to energy-related correspondence addressed to EIA, and assists DOE staff in directing inquiries to the proper office within DOE and other Federal agencies. NEIC also publishes the *Energy Information Directory*, which is a listing of most of the government offices that are involved in energy matters, by their specialties.

While the Energy Information Administration does collect information on energy use in the U.S. Virgin Islands, this data is combined with information from Puerto Rico; therefore, no specific analysis of the U.S. Virgin Islands can be made. It is necessary to persuade the EIC to maintain data on the U.S. Virgin Islands separate from other areas; this information should be easily attained by the VIEO.

### **4. Federal Emergency Management Agency (FEMA)**

FEMA is the Federal agency charged with overall responsibility for emergency management, the counterpart on the Federal level to state and territory emergency management agencies. As such, FEMA plays a critical role in domestic emergencies of all types, and DOE coordinates closely with FEMA.

In a recent joint decision between the Department of Defense and the Department of Transportation, the Integrated Emergency Management Information System operated by FEMA was selected as the base mapping system to be used for the development of a worldwide Strategic Transportation Network Information System.

The VIEO is responsible for informing the Governor of what aid is needed from FEMA. The Governor will then contact the agency and request assistance during times of a general emergency or a specific energy emergency.

### **5. Federal Interagency Coordinating Committee on Digital Cartography (FICCDC)**

There are considerable computer-based mapping efforts underway within the Federal government and in the private sector. The FICCDC monitors and coordinates these activities within the Federal government.

of the economy such as Federal, state/territorial and local agencies, Congress, industry and business. Information about the nature, severity and possible duration of the emergency is essential. It is also vital that the public understand what needs to be done by each sector to ease and eventually solve the crisis. A lack of adequate information concerning the emergency situation and the actions that are being taken to cope with it can lead to undesirable reactions or panic that will only exacerbate the crisis.

Providing information to the public is important, but it is equally important for government to receive information on the impacts of the emergency as well as suggestions and recommendations from citizens and groups. Input from the private sector can aid the Federal government in tailoring the response to the specific characteristics of the emergency. Modifications, adjustments or the redesigning of Federal actions may be needed in response to feedback on changing market conditions, unanticipated problems or private sector emergency activities.

The public information program plan within DOE establishes a two-way flow of information between and among affected parties. During non-crisis periods, the routine external communications program continues to operate under DOE's *Office of Congressional, Intergovernmental and Public Affairs*. Public information activities during an emergency will be managed by a Communications Task Force, to be part of the Energy Emergency Management System (EEMS). The task force is composed of a variety of specialists in public information, energy conservation and regional liaisons. Depending on the nature of the emergency, support from other department officials (e.g., the SPR Office during a petroleum disruption) is provided as necessary. This integration with the EEMS process affords the energy emergency public information program a high profile during the formulation of a response strategy.

Specific activities carried out by the Communications Task Force within DOE include: (1) developing press releases; (2) disseminating conservation publications; (3) establishing a toll-free number and responding to inquiries from the general public, industry and other government offices and (4) developing specialized or technical information packages for distribution to appropriate audiences.

DOE's plan identifies target audiences such as Congress, state, territorial and local governments, industry and business leaders, news media and consumers, as well as effective communication tools and channels to ensure a continuous flow of information between the various participants. It also identifies a series of actions, consisting mainly of conservation and coping measures, which the Federal government can advocate to the public to reduce overall demand and thus the hardships caused by shortages. Such actions—including greater use of mass transit, ride-sharing and reducing speed limits—can be used singularly or in combination to help reduce energy demand.

These public information activities are designed to prevent panic and counter-productive actions during an energy emergency, as well as to strengthen the links of communication between industry, states/territories and the Federal government.

The information obtained from the Federal government is disseminated through the Virgin Islands Energy Office in conjunction with the Public Relations Office. Federal initiatives are modified to maximize applicability to the Territory in terms of useful information and response measures.

## **CHAPTER VII**

### **CONCLUSIONS AND RECOMMENDATIONS**

- A.** The possibility of energy emergencies exists as a result of natural disasters as well as man-made disturbances and shortage situations. It is imperative that the U.S. Virgin Islands be prepared for just such an occurrence with integrated response mechanisms in place for a coordinated effort by the Territorial agencies. The information contained in this plan should be used to ensure the continued supply and/or appropriate allocation measures during an energy emergency.
- B.** An energy emergency simulation workshop held in August, 1990, in the U.S. Virgin Islands, with representatives from the separate Territorial departments and private industry, allowed new ideas to be expressed and a greater understanding of the functions and responsibilities of the individual agencies. This plan was designed to more clearly define the roles of each agency and what actions can be taken in order to mitigate the effects of the emergency.
- C.** Information concerning the reasoning for energy emergency planning, authority for implementation of measures, analysis of consumption patterns and trends, economic assistance and training were discussed. The following recommendations are not substitutes for the information in the preceding chapters but emphasized points taken from them.
  - 1. The dependence of the U.S. Virgin Islands on petroleum for the production of electricity, the desalination of water as well as transportation and other consumption uses places the Territory in a precarious situation. Preparatory measures must be taken to deter an energy emergency from occurring but in the event that one does occur, the U.S. Virgin Islands must be prepared with a course of action already in place and the agencies already assigned their roles and responsibilities. This includes maintaining a database of energy related information, training simulations and exercises and exploring energy alternatives to reduce the U.S. Virgin Islands dependence on one energy source.
  - 2. The Governor is responsible for declaring a state of emergency, and while the legislation does not specifically state an energy emergency, the Governor does have authority in this situation. In the event the Governor, or in his absence, the Lieutenant Governor, is unable to perform this task, the Adjutant General may take responsibility and declare a state of emergency.
  - 3. The Virgin Islands Energy Office will act as the lead agency in an energy emergency, coordinating the Territorial agencies in its response mechanisms. This does not mean that VIEO will act as the lead agency for each measure but will instead oversee the efforts of the separate agencies.
  - 4. Communication within and between agencies is essential in responding to an energy emergency to reduce redundancy and prevent the actions of one department from interfering with the efforts of another. In addition, communication between the Territorial government and private industry is extremely important. The energy emergency measures performed by each should be strengthened through preparatory planning, exchange of information and training exercises.
  - 5. Communication with the public is vital to reduce panic and provide information that will assist them in responding to the emergency. The Virgin Islands Energy Office will gather information from the separate agencies and will produce one complete information packet which will reduce conflicts in information from the individual agencies. In addition, VIEO will work in conjunction with the Governor's Office which will also be making statements to the public.