"U.S. Oil and Chemical Accident Preparedness and Response"

by

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Introduction

I am pleased at the opportunity to come to Japan to participate in this International Forum on Safety Control and Risk Management. I welcome the opportunity to tell you about U.S. efforts to deal with chemical emergencies and oil spill accidents. I look forward to the international exchange of information and guidance on dealing with the safety and control of technological hazards.

My talk is organized in three segments:

- (1) the U.S. national organizations and their experience in chemical accident prevention and preparedness
- (2) U.S. Capability to respond to major oil spills since Exxon Valdez (1986)
- (3) How BPA responds to technological hazards resulting from major natural disasters

Section I: U.S. Experience In Chemical Accident Preparedness and Prevention

The U.S. Emergency Response Framework

More than 10 years ago, a large quantity of methyl isocyanate was accidentally released from the Union Carbide facility in Bhopal, India, resulting in a terrible disasters that killed more than 2,000 people and injured thousands of others. As a result of this incident, the United States and many other countries have changed the way they deal with accidents involving hazardous chemicals. After the casetrophic release in India, the American public began to ask, and continues to ask, such questions ask "Could it happen here?" "What can we do to prevent it?" "If it does occur, what should we do to protect ourselves?" Similar questions were also being asked throughout the world and, in most cases, the answers were not very comforting.

First, let me explain that the United States has had a national system for responding to oil and hazardous substance spills or releases for over twenty years. The National Contingency Plan (NCP),

which was set up under the Clean Water Act and the Comprehensive Environmental Response, Compensation and Liability Act, was developed to ensure that the resources and expertise of the federal government would be immediately available for those relatively rare but very serious incidents that require a national or regional response. The NCP established the National Response Team (NRT), a unique organization of 16 federal agencies (throughout the continental U.S., Caribbean, Pacific Islands, and Alaska) each having broad responsibilities in environmental areas. The National Response Team is responsible for coordinating federal planning, preparedness, and response actions. Integral to the national response system is a strong Regional Response Team (RRT) system, presently there are 13 RRTs, that includes offices of the same federal agencies, as well as state participation. During a response, the purpose of the NRT and the Regional Response Teams (RRTs) is to support, provide guidance to, and assist the federal On-Scene Coordinator (OSC); at all other times, the purpose is to assure that an effective and functional infrastructure is in place at all levels of government-federal, state and local-for response, preparedness, and mitigation. OSCs and their local and state counterparts are the backbone of the system, in that they are responsible for ensuring quick and efficient response to oil and hazardous chemical spills and releases.

After the Bhopal accident, the United States immediately developed and implemented the Air Toxics Strategy, a broad strategy that addressed both accidental and routine releases of hazardous chemicals. The portion of that program concerning accidental releases became known as the Chemical Emergency Preparedness and Prevention (CEPP) Program. The CEPP Program recognized that the basic responsibility for understanding risks to localities for trying to lower those risks, and for responding to an emergency, must take place at the level of government closest to the event. The program encouraged local response personnel, scientists, risk evaluations, and physicians to work together both before and after an accident occurs. The goal of the CEPP Program has been to empower the local communities to be prepared for and prevent chemical incidents by ensuring the community is aware of the presence and emissions of chemicals into their environment in order to make intelligent and informed decisions about protecting their communities' health and environment.

Concurrent with the CEPP effort, the U.S. Chemical Manufacturers Association, designed a program called Community Awareness and Emergency Response (CAER). CAER provided guidance and advice to industry concerning local community involvement and interaction. The CEPP theme of

working together was echoed in the CAER Program. Everyone agreed that the public is best protected by an integrated program that involves industry working cooperatively with elected officials and emergency managers, governmental authorities, risk assessors, and health officials. Similar industry involvement occurs for oil spills through the American Petroleum Institute, regarding petroleum manufacturing and storage facilities and oil pipelines.

Local Level Participation: The Key to Emergency Preparedness

In the U.S., given the large size of the country, the central government cannot and should not attempt to manage all aspects of risks and emergencies. No matter what the form of the government structure, prevention, preparedness, the response to accidental releases of hazardous chemicals can be effectively dealt with at the local level. The area of Japan is roughly equal to the state of California, so you can appreciate our problems of size.

It cannot be emphasized enough that the local community and its officials will be responsible primarily for handling an incident. If a chemical plant in Houston, for example, has a release, it is public officials in Houston, not those in Washington, DC that must take immediate action, and it is Houston that must be prepared for such an incident. Only if the incident moves beyond the local communities' capabilities would the state and federal portions of the emergency system be activated.

Federal Enabling Legislation

When the U.S. Congress enacted the Emergency Planning and Community Right-to-Know Act, also known as Title III of the Superfund Amendness and Reauthorization Act of 1986 (SARA), they reaffirmed the basic premise of the work that the Environmental Protection Agency had initiated. To the CEPP concept, the law added structure for preparedness activities and provision of specific information on hazards, as well as enforcement authorities in the event industry did not comply with the know, Title III placed responsibility for establishing organizations and actually preparing for emergencies at the state and local levels through the new State Emergency Response Commissions (SERCs) and Local Emergency Planning Committees (LEPCs).

This law, Title III, established a new relationship between federal, state, and local governments, industry and the private sector, environmental and other public interest organizations, and the general public regarding information related to chemical safety and public awareness of hazardous chemicals in communities. The law guarantees that throughout the United States citizens have access to

information on the presence of hazardous chemicals and their effect on public health and the environment. This information allows citizens to make important decisions on the quality of their life and to take action regarding the risk of major accidents. Information that facilities that handle chemicals must submit under Title III includes emergency planning information, material safety sheets, and hazardous chemical inventories.

It is important to remember that Title III did not change any risks. The law identifies information to be provided and creates a structure into which it is to be delivered. The Local Emergency Planning Committee is the group that meets periodically with guidance and advice from state and federal officials and develops a local contingency plan to assess and deal with the risks at the local level in the event of an accident. The amount of risk does not necessarily change, but now the community can determine the risks and plan for them. In fact, the community can even change the amount of risk by putting pressure on local plants to improve their chemical safety practices. And facilities must participate in the emergency planning process by providing whatever information is necessary to deal adequately with the potential risk.

Industry Responsibilities

Among the implications of the Title III program are that the primary responsibility to make information available to the public is placed on industry through the reporting requirements. Large companies have complied with Title III for the most part. One of the challenges facing the United States is reaching and educating smaller businesses about preparedness and prevention issues, in order to inform them better of innovative prevention technologies and the causes of chemical accidents as well as to increase their compliance with the law. Once accomplished, this served to reduce the risk of chemical incidents that could affect the public's health and environment. Title III opens the doors to a powerful dialogue on risk between companies and local communities.

There are additional ways that industry can actively support the intent of the law: participation in the CAFR program, providing logistical support to the Local Emergency Planning Committees, providing information to local communities before the required filing date, and reducing inventories and emissions. Enforcement against facilities that do not comply is a tool to be used by local governments and states as well as the federal government. This tool can be used effectively to achieve the goal of the law: that of working together with industry to protect the public from major chemical

accident hazards.

To further the protection of the public, and more specifically the worker, there are also requirements for facilities to develop programs to inform and train workers on the hazards of chemicals used in the work place and appropriate protective and response actions. Chemical manufacturers must provide information on hazards to everyone purchasing a hazardous chemical or a product containing a hazardous chemical as well as to the workers at the facilities. The information that must be provided includes data on the chemical composition of a product, the potential health hazards of the chemical, any health standards associated with the chemical, the physical properties, and any other pertinent information. In addition, specific limits have been established for the amount of hazardous chemical a worker can be exposed to and the type of protective equipment that must be used to prevent overexposure to a chemical by a worker.

Public Interest and Participation

Industry and local government have not been the only key players working to reduce the number and severity of chemical accidents. Environmental groups have undertaken the responsibility to test provisions of the law and to alert communities to the types of information available, often analyzing it and presenting issues for public debate on both a national and local level. Citizens are participating in the process through membership on the local emergency planning committees; it is estimated that over 50,000 public officials and volunteers serve on the 4,000 committees across the nation.

The system of state and local planning committees was developed in order to interpret and use the Title III reporting data for preparedness purposes, while fire departments use the data for response purposes. The local governments are free to determine for themselves exactly how they meet the preparedness requirements and how they follow up with facilities through inspections, code enforcement, and political pressure.

The regulations and guidance on emergency preparedness have been produced and are now aiding state and local authorities in solving some of the key issues. Examples of issues are hazards analysis, plume modelling, contingency plan development, chemical response data and the management and application of the information generated by Title III. In order to solve this problem, the United States has developed are widely distributed computer software throughout the world for this purpose.

The Computer-Aided Management of Emergency Operations (CAMEO) system can be used on both Apple and IBM-compatible computers. The CAMEO system was designed for local communities, especially fire departments and emergency responders, to help them manage the chemical information collected under Title III as well as to do computerized hazards analysis addressing the extremely hazardous substances reported under Title III. Each system also includes a database of over 2600 chemicals containing information for first responders to chemical incidents. All of this information will assist in developing and refining the chemical emergency plans required under Title III and improve the management of information on environmental issues at the local level. In addition to this kind of support, brochures, technical guidance manuals, and fact sheets have been published and distributed as part of an extensive communications program.

The Ultimate Goal: Preventive Accidental Releases

As another component of Title III, the United States examined chemical accident prevention technologies in facilities across the country that manufacture, use, or store hazardous materials. This project has been the springboard for the development of a full chemical accident prevention program. This new voluntary program recognized the need to combine information programs and voluntary good management practices with more conventional requirements.

One effort underway as part of the prevention program is to identify causes of significant releases and ways to prevent them as well as to share that information with industry the public, and other interested parties. This effort includes the accidental release information program, which gathers information on causes of significant releases and initiatives taken by industry to prevent recurrence.

Another current prevention effort is a program to conduct chemical safety audits at facilities that have had a release of a hazardous substance. Audits by teams of trained specialists review technologies and safety practices in use in plants, but they also concentrate on management approach and top-level commitment to safety. The audits can provide a better understanding of the causes of chemical releases and can also identify successful, fieldproven prevention technologies and practices. This information can be shared across industry and made available to facilities to help them plan process safety programs that are individually suited to their own site-species needs. The audits can also stimulate facilities to develop a greater awareness of chemical safety, an understanding of available techniques, and specific suggestions for improved programs.

The 1990 amendments to the Clean Air Act add new legal requirements that complement the voluntary safety practices and regulations already begun and expanded upon under Title III. The accidental release provisions of the Clean Air Act provide requirements for industry and the United States government to work toward preventing chemical accidents. That legislation requires facilities to provide information on the identity and location of chemicals on site, the quantity stored, and annual emissions. The new clean Air Act Amendments will provide additional information on the way businesses manage chemical risks and work toward reducing risk to the community. At the same time, the new law encourages facilities to improve their safety practices. The Clean Air Act Amendments clearly place the responsibility for ensuring safe operations on industry. They call for facilities to identify hazards using hazard assessment techniques, to design and maintain a safe facility, and to minimize the consequences at accidental releases.

One particular requirement within this new law is for facilities with certain chemicals above specified quantities to prepare a risk management plan. At a minimum these plans will include a hazard assessment, a prevention program, and an emergency response program. When complete, the plans will be submitted to states and local emergency planners, thus complementing information received under SARA Title III.

An additional requirement under the new Clean Air Act is a study on hydrofluoric acid (which was completed in September 1993), other research projects may be carried out as well. Among the most significant of these requirements is a standard covering chemical process safety in the workplace. Information gained from the previous and continuing voluntary prevention program is now being used to assist in devising reasonable regulations and appropriate guidance for chemical accident prevention under to Clean Air Act.

Preventing releases of hazardous chemicals to the air, as well as to the water and land, requires a continuous, concerned effort by industry to identify its hazards and provide the technology, training, maintenance, re-evaluation , and -most important - management vigilance to deal with them safely. It is a continuous process that must take into account the unique hazards of the chemicals and processes, the capabilities of personnel at specific plants, and potential impact on the local community on a site-by-site basis. This process must be conducted at every stage in the development and life of a facility, such as siting, plant design, process design and redesign, start-up, and shut-down. Preventing releases

requires commitment at every level in a company, as well as an acute awareness of the needs of and commitment to assisting downstream users. It means a deep need for developing and sharing information on chemical hazards, causes of accidents, and ways to prevent their industry has a clear responsibility to take all possible steps to operate safely. A comprehensive prevention approach must focus on making industry meet this obligation and must avoid the establishment of a minimum standard beyond which industry will not feel the necessity to move.

Further, any approach to preventing accidents must be coordinated and integrated to involve all key participants, such as industry, federal, state, and local government, labor, environmentalists who represent the general public, trade and professional organizations, the banking insurance legal community, the medical profession, the press, and academia. It must focus on the development and sharing of information on new technology, improved safety practices, and lessons learned from accidents and from near-accidents. Particular emphasis must be placed on reaching the smaller businesses that handle chemicals and adapting technology and management practices to their needs. Liability must continue to reside with industry, that means that the polluter pays the costs of cleanup and response.

A Global Issue: Reducing Chemical Risks

The United States is not alone in grappling with issues of hazard assessments, technology, emergency preparedness, and prevention. Several international organizations have efforts under way in these areas. Very significant is the work being done by the Organization for Economic Cooperation and Development (OECD), which has developed guiding principles on accident preparedness and prevention for use by non-member countries. To assist in this effort, OECD's Group of Experts on Accidents Involving Hazardous Substances held a series of workshops on the roles and responsibilities of labor and industry and of government in preventing accidents, information to the public, port safety emergency preparedness and response, and research.

In addition, OECD is promoting the exchange of information on specific accidents and working with the United Nations Environment Programme (UNEP) to identify networks for response. UNEP also has developed the Awareness and Preparedness for Emergencies at a Local Level Program (APELL) using various aspects and concepts of the United States' title III program. APELL describes a process for improving awareness of hazardous installations and preparing emergency response plans for use in industrializing nations. It is presently being field-tested in several countries and UNEP

sponsors APELL Workshops in developing nations to train those industrializing nations on the APELL program. The United States is also currently working with UNEP to modify the CAMEO system to support the APELL process. These organizations are working together to help the industrialized nations share the important technology of chemical accident prevention and the important guidelines and standards for preparedness and response, as well as ensuring that this information is passed along to the industrializing nations.

Efforts of the European Community

Another approach to protecting human health and the environment is that of the European Community in its implementation of the Seven Directive. Under the Directive, facilities are required to develop on the emergency response plans. The "competent authorities" or the implementing authorities must develop off-site plans. The implementing authorities vary from nation to nation. In many countries, the implementing authorities are local or district councils; in other countries regional authorities are responsible for implementing the law. The directive also requires each nation to provide information to the public about the hazards from facilities, appropriate protective actions, and methods that will be used to warn them of an accident. The scope of the directive is defined by a list of characteristics of covered industrial facilities as well as by a list of 178 chemicals.

With regard to chemical accident prevention programs, the directive defines two levels of potentially hazardous facilities, based on the types of processes or storage carried out at the facilities, and the identities and amounts of substances present at the facilities. These two categories of hazardous facilities can be referred to as less hazardous and highly hazardous facilities. The division between the two categories is generally based on the quantity of listed chemicals on site. Facilities in the less hazardous category are subject to the requirements for reasonable care. Facilities must "take all measures necessary to prevent major accidents", and more specifically, identify existing hazards, adopt appropriate safety measures, provide employees with adequate information and training to ensure their safety, and demonstrate to government inspectors at any time that they have complied with the foregoing requirements. Facilities in the highly hazardous category are required to submit a detailed notification to the appropriate government agency, informing the agency that the facility meets the definition of highly hazardous, and providing a considerable amount of information regarding the facility's operation, hazards, and safety program.

All facilities subject to the Seven Directive must investigate any major accidents that occurs at these facilities, and must provide information to the appropriate government agencies regarding the causes of such accidents, and the measures taken to prevent recurrences. The basis behind the Seven Directive is one of requiring facilities to complete specific chemical process safety measures as stipulated in regulations.

European/U.S. Collaborations. During the past several years the international community has made strides to address issues concerning the transboundary impacts of industrial accidents such as expioaions, fires and chemical releases. In October, 1989, the 35-nation Conference on Security and Cooperation in Europe convened in Sofia, Bulgaria to discuss this and other issues, CSCB provides an important basis for following up on the Helsinki accords.

The Sofia conference not only outlined ways to enhance the prevention of, preparedness for and responses to trans-boundary industrial accidents. It pointed out the importance of the public having a right to know about the potential impact of releases and to have an opportunity to participate in the decisions relating to prevention and preparedness. As a result of this following conference, the United Nations Economic Commission Europe has developed an international convention addressing the environmental health and safely problems resulting from trans-boundary industrial accidents. That Convention on the Trans-boundary Effects of Industrial Accidents has led to a great deal of work being done to assist countries in transition. The development of the two UNBCE Regional Coordinating Centers in Hungary and Poland are a result of countries in transition working toward the implementation of that Convention.

The programs initiated under Title III and under way at the international level present great opportunities. They require charges in attitude and philosophy and in behavior. They require the development of new relationships among the various components of the affected population. Submission of data according to legal requirements must be timely and careful which requires continuous analysis of data. Effective and responsive leadership from industry and government at all levels are critical to program success. Just at important however is the active participation of individuals working together toward the common objective of increased public health and safety from the risk of hazardous chemicals.

Section II: U.S. Actions Regarding Oil Spill Response Capability Since 1986

So far I have spoken with you generally about the system in place by the U.S. and world-wide regarding chemical accident prevention preparedness and response. There have been natural and technological events however which have stressed our system and I would like to speak briefly about these large-scale events which resulted in changes in legislation and policies in the U.S.

In March 1989 the tank vessel Exxon Valdez struck a reef in Prince William Sound Alaska resulting in the largest oil spill in U.S. history. The magnitude of the spill revealed numerous weaknesses in the state of oil spill contingency planning and response readiness at the Federal state and local levels. As a result of the spill, the President directed the National Response Team (NRT) in April 1989 to study to nation's overall capability to prevent and respond to oil spills of national significance and recommend improvements.

Two Reports to the President were prepared to fulfill the mandate to study oil spill preparedness capabilities. The Exxon Valdez Oil Spill (1989 report) developed by the NRT shortly after the Valdez incident, focused specifically on analyzing the preparedness for and response to the incident. In October 1990 the NRT developed the more detailed Oil Spill Contingency Planning: National State (1990 report) which expanded upon the contingency planning issues examined in the 1989 report. The 1990 report focused on the nation's overall contingency planning and response capabilities and was not limited to analyzing the Valdez incident. Both studies concluded that there were significant gaps in the state of oil spill readiness at the time of the Exxon Valdez disaster. The studies included specific recommendations for addressing those gaps and strengthening the nation's oil spill response and planning capabilities particularly in areas where resources had been "stretched thin".

Overview of Recommendations

Many of the specific recommendations of the two reports have been addressed and the nation's oil spill prevention preparedness and response strategies have been vastly improved. However, there remain some areas in which additional action is necessary to further improve the nation's capability to address oil spill emergency preparedness and response. The reports pointed to many gaps in the nation's oil spill prevention, preparedness, and response strategy at the time of the Exxon Valdez accident. These conclusions were developed from lessons learned in the response to the incident as well as from reviews of contingency plans and analyses of worst-case scenarios.

The reports generally concluded that resources were stretched very thin at the line of the Exxon Valdez incident, and that none of the governmental or private parties involved in the spill were properly prepared to respond to a spill of such magnitude. On the basis of these conclusions, the 1990 report identified several specific recommendations for correcting such preparedness shortfalls and devoting resume consistent attention to the issue of oil spills.

The 1990 report recommended improving/enhancing capabilities and resources to combat oil spills particularly with regard to the National Response System response resources and contingency planning. The recommendations identified specific reforms such as: (1) enhancing planning efforts especially for high-risk catastrophic spills; (2) increasing the availability and potential mobilization of response resources including state-of-the-art equipment and trainees personnel; (3) promoting more effective coordination of contingency planning among various levels of government and industry; (4) accelerating the use of and research into innovative cleanup techniques; and (5) further promoting oil spill prevention.

Overview of OPA 90

The nation's overall oil spill strategy, and the attention that has been devoted to the issue of oil spills, have changed significantly since the time of the Exxon Valdez. The most important change has been the development and implementation of the Oil Pollution Act of 1990, 33 U.S.C. #2701(OPA 90).

Although OPA 90 evolved over the course of decades, the Exxon Valdez incident clearly was a strong force motivating Congress to revalue oil spill prevention, preparedness, and response capabilities. In fact, the provisions of OPA 90, and the implementation of these provisions by the Coast Guard, EPA, and other Federal agencies, help begin to address many of the preparedness shortcomings identified by the 1990 report. This section briefly summarizes the key provisions of OPA 90, in order to provide a context for discussing the implementation of the recommendations of the 1990 report.

Changes in Contingency Planning

Perhaps the most important way in which OPA 90 enhances oil spill preparedness is in its elaborate system of contingency planning, from the national level to the level of the individual facility or vessel. The center of this planning system is the National Oil and Hazardous Substances Pollution

Contingency Plan (NCP). Although the NCP has been in existence in some form since 1963, OPA 90 significantly expands its scope. For instance, Congress intended the strengthened NCP to more thoroughly address worst-case discharges, there to fish and wildlife, use of spill-mitigating substances, and several other issues.

In addition to expanding the NCP, OPA 90 creates completely new Federal planning and response entities and responsibilities. The President is also required to develop "area" planning committees and contingency plans. The Coast Guard, for instances, is required to create a National Strike Force Coordination Center, and district response groups.

Individual facilities and vessels are required, under OPA 90, to prepare response plans. These plans primarily verify that the facility of vessel possess the personnel, resources, and procedures to prevent and address oil spills. Although facilities have been required to prepare response plans since 1973, OPA 90 requires far more extensive response plans.

Sec. 4202 of OPA strengthens planning and prevention activities by (1) providing for the establishment of spill contingency plans for all areas of the U.S.; (2) mandating the development of response plans for individual tank vessels and certain facilities; and (3) providing requirements for spill removal equipment and periodic inspections. These efforts are intended to result in more prompt and effective cleanup or containment of oil spill's thereby preventing spills from becoming large and reducing the amount of damage caused by oil spills.

The development of Area Contingency Plans will assist the Federal government in planning response activities. In addition. The Area Committees, to be composed of qualified Federal, State, and Local officials, will be created to develop Area Contingency Plans. At a minimum, Area Contingency Plans are intended to ensure the remove of a worst case scenario, and to mitigate or prevent a substantial threat of such as discharge, from a vessel or facility in or near the area covered by the plan. Area contingency plans will describe the areas of spectral environmental importance, outline the responsibility of government agencies and facility of vessel operations in the event of a spill, and detail procedures on the coordination response plans and equipment.

Other Changes

In addition to improving the network of contingency and response planning, OPA 90 introduced a number of other far-reaching changes. These provisions significantly strength the Federal approach

to preventing and responding to oil spills; they are as follows:

- Create a comprehensive Federal Liability system for oil spills, which greatly increases the types and amounts of damages for which spillers are liable;
- Create a single, unified, and significantly expanded oil spill trust fund, to pay for the costs of Federal oil spill response;
- Institute tougher means by which the U.S. can verify vessel financial responsibility, assess penalties, and conduct Federal removal actions; and
- Impose broad structure requirements for tank vessels, including a schedule for phase-in of double hulls.

Improvements in the Response Structure for Spills of National Significance

In the 1989 (Exxon Valdez report) several improvements were recommended in the national response system in the wake of the Exxon Valdez spill. The Exxon Valdez report specifically recommended improving the response structure for oil spills of national significance. As stated on page 10 of the report:

The National Oil and Hazardous Substance Contingency Plan [NCP] (40 CFR Part 300) should be reviewed and amended as needed, to ensure that it activates the most effective response structure for releases or spills of national significance. Such release of spills should be defined... and a pre-established, integrated command and control mechanism should be identified to address them. This mechanism is necessary to utilize effectively the resources of the parties responsible for the spill, the 14 federal agencies in the NRT/RRT structure, and the affected state or states and local governments.

The NCP was revised on September 15, 1994 (59 FR 47384), to reflect changes required by Section 4201 of the Oil Pollution Act of 1990 (OPA 90). The revisions to the NCP address the recommendation from the Exxon Valdez report in several ways, as described below.

Definition of a Spill of National Significance

The revised NCP (40 CFR 300.5) defines a Spill of National Significance (SONS) as a spill that due to its severity, size, location, actual or potential impact on the public health and welfare or the environment, or the necessary response effort,

is so complex that it requires extraordinary coordination of federal, state, local, and responsible party resources to contain and clean up the resource.

The NCP states that spills may be classified as a SONS by the Administrator of BPA (for spills in inland waters) or the Commandant of the U.S. Coast Guard (for spills to coastal waters). These provisions therefore address the recommendation in the Exxon Valdez report to thoroughly define a spill of national significance.

Response Command and Control Structure

The recommendation in the Exxon Valdez report to establish an integrated command and control system for spills of national significance is addressed by the NCP revisions in several ways, as described below.

- The NCP provides for a new response structure for all spills that better coordinates the resources of all levels of government and the responsible party. Specifically, Subpart B of 40 CFR Part 300 describes the response structure as a "unified command system" that brings together the federal government, the state government and the responsible party (with the OSC maintaining authority) to achieve an effective and efficient response. The state government, under this structure, would solicit local governmental involvement. This system is designed to increase coordination and cooperation during a response, and thereby more effectively utilize all available resources.
- The NCP contains a section on specifically responding to SONS (40 CFR 300.323), which provides for additional coordination and command integration for such spills. The NCP creates a "strategic management" framework to assist the On-Scene Coordinator (OSC) with coordinating governmental resources, public and media relations, and resource administration for responses to SONS. This provision was created in recognition of the extraordinary level of coordination that is necessary for major spills, which would be a significant burden on OSCs to manage alone. The NCP establishes that, for inland water spills, the Administrator of EPA may designate a senior EPA official to manage the strategic management task by coordinating federal, state, local, and responsible party resources. This coordination may involve, as appropriate, the NRT, RRT(s), the Governor(s) of affected state(s), and the mayor(s) or other chief executive(s) of local government(s). The framework for strategic management for SONS is explained in the proposed NCP revisions (58 FR 54721).

The unified command system and the additional strategic management framework established

for SONS, provide for a more integrated command and control structure for responding to oil spill, which is designed to more effectively coordinate resources from all levels of government and industry. These structures, which conform to the OSHA definition of incident command systems (29 CFR 1910, 120), therefore specifically implement the recommendation from the Exxon Valdez report.

Section III: How EPA Responds to Technological Hazard(s) Resulting from Major Natural Disasters

Disaster events increasingly combine natural and technological hazards. In the past few years, a large part of the workload of my office has been generated by major natural disasters. I want to share with you some recent experiences we have had in the U.S. and refer to some related experiences elsewhere in the rest of the world.

One resort that emergency management is so difficult in the U.S. is that the country is subject to virtually every major form of natural disaster that occurs in the world earthquakes, tsunamis, coroadoes, floods (coastal and riverine), winter ice and snow storms, subsidence, landslides, forest fires, and also hurricanes, windstorms and thunderstorms, volcanoes, and droughts.

In recent years many natural and technological disasters have occurred that require national organizations and Federal agencies to respond in order to protect citizens and communities. The Federal government's outlay for natural disasters in recent years has been escalating. While there may not necessarily be a steady increase in the number and cost of events in the past few years the U.S. has experienced a significant cost burden in responding to disasters. This burden falls on both the public and private sectors.

Along with the increasing costs of natural disasters are the negatiave environmental impacts resulting from such everts. The emergency management community as well as the general public are becoming more aware of the near and long-term effects of disaters, including their environmental impacts. In the wake of several major natural disasters in 1992, EPA has been increasingly involved in not-only the immediate response to these events but also to the environmental protection and restoration issues in their recovery. EPA officials responded to over 40 hazardous materials incidents, assisted in damage assessment and repairs of water and wastewater systems; performed public health assessment of the environmental hazards associated with the mass burning of garbage and deburis; and established an air monitoring network for burning. Issues of water quality (both drinking water

and waste water treatment) and air quality became highly important. The large amount of debris that had to be burned produced air plumes that were carefully monitored by EPA to protect the air quality.

EPA's Role in the Federal Response Plan

The process for activating the Federal Response Plan begins when the governor of a state requests federal assistance from the President. The President may provide federal resources to the affected areas by declaring an emergency or disaster. Once the President has made such a declaration, FEVIA is responsible for activating and implementing the FRP. EPA, along with 5 other federal departments and agencies, is ready to provide assistance. The Federal Response Plan groups federal assistance into 12 functional areas called Emergency Support Functions or ESFs.

ESF #10: Hazardous materials provides for a coordinated response to large-scale releases of hazardous material by incorporating the response mechanisms of the national Oil and Hazardous Materials Pollution Contingency Plan. The Director of EPA's Chemical Emergency Preparedness and Prevention Office serves as the chairman of ESF #10. He is also EPA's representative to the federal interagency policy-level coordinating body, the Catastrophic Disaster Response Groups. He ensures that the Agency has carried out the proper planning and preparedness activities; and is ready to assist state and local governments in responding to a major disaster.

During the Midwest floods of 1993, EPA assumed significant responsibility under ESF #10. In the nine states that were declared disaster areas, ESF #10 personnel responded to incidents involving hazardous materials such as releases of chemicals, oil gasoline, and propane. Under ESF #10, EPA was charged with collecting over 1600 free-floating drums and containers in the flooded areas. In Missouri and other flood affected states, EPA personnel coordinated a household hazardous waste collection program and coordinated an extensive water sampling program. Thousands of pounds of household hazardous materials were collected during these operations and safely disposed of to prevent the waste from eventually being deposited in local landfills.

FRP Links with the National Response Team. In the 1970's the federal government set up a mechanism for responding to large-scale releases of hazardous substances or oil spills: the National Contingency Plan. That response capability was developed to ensure that the resources and expertise of the federal government would be immediately available for major incidents that require federal, or regional response. The NCP established the National Response Team, which is now composed of 16 federal

agencies and departments. The NRT is chaired by EPA and co-chaired by the U.S. Coast Guard. In addition, the NCP set up Regional Response Teams with representatives of the same agencies and departments as the NRT, while the U.S. Coast Guard serves as the vice-chair, EPA and the Coast Guard co-chair the RRTs.

At the EPA headquarters level, the ESF #10 chairman serves as a bridge between the National Response Team and the Federal Response plan partners. The ESF #10 chairman is also the chairman of the National Response Team. At the regional level, the regional ESF #10 chairs are also a co-chair of the RRTs.

In the 1990s the Federal Government established the Federal Response Plan (FRP) to address major natural disasters. When the FRP was developed, the NRTRRT structure for handling hazardous materials releases and oil spills was already in existence. ESF #10 was incorporated into the frame work of the FRP to ensure coordination between the National Contingency Plan (NCP) handling oil and hazardous substance incidents and the Federal Response Plan addressing natural disasters. The Federal Emergency Management Agency provides the coordination for natural disaster under the FRP. The Federal Response Plan also provides the frame work for addressing terrorist incidents similar to the tragic release of serve gas that occurred earlier this year in Tokyo. In cases such as this, the Inside Department's Federal Bureau of Investigations (FBI) would be the lead Federal Agency.

Recent U.S. Experience With Natural Disasters Involving Technological Hazards

Three recent major natural disasters -- Hurricane Andrew in Florida (1992), the Midwest Floods of 1993, and the Northridge (CA) Earthquake of 1994 -- have highlighted the increasing interrelationships between natural and man-made disasters. The technological emergencies and significant environmental impacts generated by natural disasters are aspects of natural disasters that often go unobserved. Further, these recent events leave produced environmental impacts and technological hazards that were greater in number and importance than had been experienced before. Such impacts made both the response and recovery activities to these events more complex and more protreated.

Northridge, California Earthquake (1994)

Although the U.S. has not experienced a major, damaging earthquake in an urban area comparable in impact or in cost to the Kobe (1995) event the most recent major earthquake in the U.S.

occurred in the Los Angeles County area of California in 1994. On January 17, 1994 at appropriately 4:30 a.m. California time, an earthquake estimated at 6. Richter magnitude struck Southern California, claiming 57 lives and injuring more than 6,500. Over 3,000 aftershocks occurred in the subsequent weeks, further shaking up the already ranked population. Fortunately, there were few large-scale hazardous materials incidents that posed a threat to the human population or the environment. The experience of California's hazardous materials response personnel, the long term efforts at seismic resistance and construction for all structures, and the fact that the earthquake took place in a light industrial area all meant that local and State officials were well prepared to react quickly to the small hazardous materials incidents that did occur.

Although suffering major damage to the interstate highway systems and to many dwellings and offices buildings, the metropolitan Los Angeles area was fortunate that a major chemical release or oil spill did not occur which could have caused further destruction to already seriously impacted systems. Pipeline releases were handled by industry. Given the unusually large and capable State, county and city emergency management organizations as well as private industry, those organizations rather than the federal government handled virtually all responses to hazardous materials and oil spill incidents. The EPA and the U.S. Geological Survey assisted and monitored. It remains to be determined to what extent the state-required seismic-resistance construction standards, the emergency preparedness efforts, organizations in place, and good luck at the early morning timing of the quake were the reasons for the limited amount of environment impact. What remains to be seen is to what extent this positive and efficient response experience can be repeated in other States and for non-earthquake events.

Recent U.S. Response Experience. In the U.S. deaths from disasters are quite low, but as noted earlier, the costs of relief are escalating. While the number of major natural disasters that receive Presidential declarations of disaster has not grown significantly, the cost of such events in the past four years has jumped dramatically. For the federal fiscal years 1984 through 1989, the cost of federal disaster relief outlays was not more than \$500 million per year. For the years 1990, through 1993, the same outlays were \$1,026 million, \$392 m., \$1,726 m., and \$2,554 m., respectively.⁽¹⁾

Four individual natural disaster events in the U.S. have required huge federal expenditures as well as great outlays by other levels at government and insurance companies. The estimated total costs of some recent events are:

- Loma Prieta Earthquake (1989) -- \$8. billion
- Hurricane Andrew (1992) -- \$30 billion
- 1993 Midwest Floods -- \$20 billion
- Northridge Earthquake (1994) -- \$30 billion

While we in the United States are fortunate in that we have not experienced a large number of deaths and injuries during most of this century, elsewhere in the world there have been many, very deadly disasters. Examples include: The Armenian Earthquake (1988) -- 55,000 persons dead; The Mexico City Earthquake (1985) -- 10,000 persons dead; and Bangladesh Floods (1991) -- 140,000 persons dead. To the extent that the U.S. can share technical, organizational, as well as emergency management experience, we want to do so.

International Response Activities. EPA frequently is requested to provide assistance to foreign government, and does so with the cooperation of the Department of State and the National Response Team (NRT) agencies. In 1992, EPA responded to significant emergencies, such as the gas line explosion in Guadalajara, Mexico and the oil spill in the Republic of Uzbekistan. In both events EPA sent teams of expert advisors. Another incident the EPA has assisted with response is the Kuwait Oil Fires, where EPA provided air monitoring to ensure that the Kuwaitis and the U.S. soldiers were not at risk.

⁽¹⁾ For additional data on the numbers and costs of Presidentially-declared in the U.S. see "Facing the Challenges-The U.S. National Report to The IDNDR World Conference, Yokohama, Japan, May 23-27, May 23-27, 1994."

Many of the U.S. experiences are typical of what has been observed world-wide, according to a recent UNEP⁽²⁾ report on two decades of environmental challenges. Several researchers have acknowledged that the frequencies of major natural disasters have increased in the last two decades. At the same time, there has been a threefold increase in disaster losses. Among the reasons for these increases are: (a) at one end of the social scale, poverty and population pressure have caused more people to live in hazardous regions; (b) at the other end of the scale, hazardous situations are also increased by increasing affluence (e.g. exhaust fumes); and (c) the increasing use of toxic chemicals, radioactive materials and unproven technology, as well as extreme operating conditions in industry.

The UNEP report noted that by and large in developed countries there are relatively few

facilities but very high economic losses from accidents and disasters, while the reverse is usually the case in developing countries. Furthermore, developed countries have invested in insurance, physical defenses, and various forms of hazard monitoring and mapping. By contrast, most developing countries lack three resources. Further risk occurs when such countries import technologies that come without the complete package of surrounding safety measures. The Bhopal incident is perhaps the best-known example -- the failure of internal safety systems was exacerbated by a lack of environment and local zoning regulations and other safety programs. Several researchers have acknowledged that the ever increasing industrialization of the world as well as the quickening pace of urbanization will add to the quantitative increase and qualitatively worsening of disasters of the coming century.

(2) UNEP. *The World Environment, 1972-92: Two decades of Challenge* (1992)

Another contributor to environmental hazards in the future is chemical hazards. Even localities in the past which had few or no risks from natural disasters are now vulnerable if they have any roads navigable waterways that are used by tankers containing toxic chemicals. In short, almost any inhabited areas of societies are now vulnerable to disasters from hazardous chemicals even though there are no manufacturing, storage or use facilities in the vicinity. Not all developed societies or communities are subject to major natural hazard threats from within; but now almost all are increasingly subject to risk as dangerous chemicals in growing numbers are moved around more.

The Frustrations of Emergency Management Professionals

The emergency management community in any given country or regional area consists of a sizeable group of local, state/provincial or regional, and control or national government officials. It is essential that all of these groups work well together, which is a sizeable task to accomplish. In addition, private firms or industries may employ risk managers and other safety personnel. In the academic sector (including public and private universities) are faculty and staff members who provide technical assistance, analyses, and research and evaluation functions. There are many frustrations in an area of work that deals with large and damaging unplanned and unforeseen events.

Even where emergency planning and management is performed, the ability to deal with mitigation -- the process of anticipating a future, costly event and committing present resources to it -- is difficult to gain support and funds, when more current problems exist than resources to meet them.

Lessons Learned

How does the experience of the United States in effects to prevent chemical accidents translate to nations undergoing new or renewed industrialization? From everything that has been discussed thus far -- the impetus of a national program from a major international accident, the enactment of national legislation, the co-operation with industry, the focusing un-implementation at the local level -- there are a number of pragmatic response and prevention "Keystones" that have been identified, and I would like to share these with you. The first group relate to preparedness:

- * The first "keystone" is vigilance. Some chemical accidents takes only minutes to happen. This puts the burden of responsibility for vigilance at the source of the potential accident at the facility itself. But realistically, a manager cannot inspect a plant's process systems every minute of every day. Chemical process safety and accident prevention start with the management cadre of each plant. Through a feeling of ownership, management must communicate the commitment to safety down to every worker, so that each person feels a responsibility to report any unsafe condition and see that it is corrected. Since prevention, to be effective, must be implemented locally, this means that each plant's management must also work co-operatively with the local government and public to ensure local readiness in the event of an accidental release.

- * A second "keystone" for prevention is openness -- a willingness to share information. There are "too few" major chemical accidents in the world for any one country to develop a meaningful database on accidents, so we must all share what we know, internationally, about the causes of accidents that happened are the causes of accidents that almost happened or "near misses" and the ways to prevent them from recurring. Though prevention encompasses complex problems, we must be certain we are not all re-inventing the wheel. Openness about research, pilot programs, and new technologies or practices will minimize redundancy and guarantee productive work for us all.

- * The third "keystone" of prevention is the necessity of evaluating progress -- but the difficulty in measuring it. Ultimately, our goal is to reduce the number of accidental chemical releases that could endanger human life or the environment. But we cannot measure accidents that did not happen. Instead, we may need to establish some surrogate indicators by which to measure the degree of our success: reduction in number of injuries or deaths, reduced volumes of chemicals handled or stored at facilities, substitution of chemicals in plant processes, changes in process design and equipment, recycling of hazardous substances, and implementation of or improvement in management practices

such as hazard evaluations, inspections and preventive maintenance and worker training.

* The fourth "keystone" of prevention is training. For workers in a plant as well as residents in a community, the most effective way to learn prevention techniques is through technical training tested with exercises or simulations. Within facilities that manufacture or use hazardous chemicals, operator error has been shown to be a primary cause of accidental releases appropriate training -- including methods to detect releases, the physical and health hazards of chemicals, and methods to protect oneself -- key to preventing human error. Combined with technical assistance in the form of publications, for example, or videos, or workshops and seminars, training provides a powerful tool that enables workers and communities to know that to do in the event of a chemical emergency and how to help avert such events.

* The fifth "keystone" of prevention is mitigation, a broad term encompassing a full range of action. Mitigation means the application of a base possible technology and management practices, as well as worker training to prevent accidents or emissions at their sources. Mitigation also means effective and efficient monitoring as well as notification systems and procedures to alert a local population of a release. Mitigation should comprise up-to-date contingency plans specifically designed for the local situation so residents and workers know how to act in an emergency. Mitigation also takes in the local physicians and emergency medical technicians so that they are trained in the effects and proper treatment of those who suffer exposure to hazardous chemicals.

With respect to response, there are three additional keystone's, namely.

- Communication - the means of communication, such as equipment, as well as the quality and frequency of the interchanges are important; but so is the human communications process. The sharing of information and intelligence involves anticipating what is needed and passing along requests for assistance efficiently and effectively.
- Coordination - A great deal of emphasis has been placed on the organizational arrangements that the governmental units use for planning. It is expected that when it is time to respond to an incident, the plans will have been tested through simulation exercises. As a result of these drills, the bonds of common experience and trust will result in a better outcome. Required exercises involving industry. Federal and State governments, are scheduled years in advance in the U.S.
- Command and Control - It's essential to be clear on who is in charge during a response. Earlier,

with regard to response to oil spills, the untiled command system and the spills of national significance were discussed as ways to achieve this objective.

Taken together, these points all form some of the most fundamental building blocks to structure the prevention of and response to oil and chemical accidents. As attitudes begin to change and information flows freely, as we develop and share new safety technologies and practices, we can work to achieve our ultimate goal of no accidental releases. However, if accidents occur, we must be prepared to respond effectively.

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