RESPONSIBILITIES OF INDIVIDUAL CITIZENS DURING DISASTER

It is alright for the National Emergency Management Agency (NEMA) to have a National Emergency Plan, but how should an individual prepare himself for a disaster? This is a question which was recently asked by a concerned citizen at a function held by Victoria County Council.

"Every man should bear his own burden", say the Scriptures. And in seven words this quotation describes responsibilities of every individual when disaster strikes.

In an emergency you would not have time to start making lists of things you would need for survival. Now is the time to make your lists and your personal and household survival plans.

How will you know when danger threatens? Most County Disaster Response Plans cater for siren warning and/or public address systems. You should immediately tune in you radio to learn what the emergency is and what you should do about it. If the emergency is a natural disaster, such a hurricane, storm or flood, a radio may tell you there is a **WATCH** means that the disaster may **THREATEN** an area within 24 hours.

If the disaster is expected to **STRIKE** an area within 24 hours, the radio will give you a warning. In this case you must immediately follow emergency instructions or go to the safest place available.

All Counties/Boroughs have shelters earmarked for evacuation of threatened citizens. Most of these shelters are really schools and community centres which are not designed for long term sheltering.

Locate now where your local authorities want you to go to if disaster threatens. Become familiar with your local disaster response plan and the route to the shelter nearest to you.

Under emergency conditions, the most important survival items are shelters, water, food and sanitary facilities.

In the aftermath of a disaster the stay time in a shelter could range up to one (1) week. So a home survival plan should include a one-week supply of essentials for each member of the household.

There are many reasons why you may need to prepare shelter areas in your home. You may be too far from NEMA's designated shelters to get to them in time: or weather conditions, or possibly sickness, could make travel impossible.

Usually, any area of your house that is below ground or away from outside walls would be the safest. And there are certain supplies that you will need to store in the shelter.

A minimum supply of two gallons of water per person in sealed unbreakable plastic containers is essential. Also, water in your hot-water heater and washroom cisterns can be used safely.

Your family should build up and maintain a one-week supply of non-perishable food in the house, rotating and replacing it regularly to ensure freshness. This food should require no refrigeration or cooking as there may be no gas or electricity available in your home.

Garbage containers and buckets with covers lined with plastic bags should be included in your sanitation supplies.

A first aid kit containing bandages, antiseptic solutions and aspirin tablets and such other items should be stored in your shelter area along with a first aid handbook.

Two of the most important items for any home shelter are a battery-operated radio and a flashlight, along with a supply of extra batteries. A radio provides a vital link to the outside, giving you information about the emergency and letting you know when it will be safe to leave shelter.

In a nutshell, duties and tasks of all citizens are to know actions to take on warning signals, how to turn off utilities, what to do in case of any danger, store water and food and keep radio and flashlights on hand.

I cannot end this article better than by quoting from "The Song Celestial" by Sir Edwin Arnold:

> "If, knowing thy duty and thy task, thou bidd'st Duty and task go by - that shall be sin!"

And you will pay for this sin here and now by jeopardizing yourself and your family's safety.

SEARCH AND RESCUE AFTER A DISASTER

To a community, threatened by aggressive neighbours, war is as much a calamity as plague or a natural disaster. From the victim's point of view there is no distinction in principle between the sudden incursions of enemies and those of locusts or hurricanes. It is, therefore, natural for us to depend upon the prowess of our Defence Force to protect our people from disaster in such circumstances.

The art of rescue is to save the maximum number of lives in the shortest possible time.

Immediate post disaster rescue work will be predominantly carried out by local survivors.

This work will consist of rescuing people trapped by fallen debris, identifying and assisting seriously injured persons, and evacuating or assisting people marooned by flood waters.

Search resources will include reports from family/friends, listening for sounds and dog teams.

The Defence Force will then come into play with their known qualities of courage and fidelity to duty by providing specialised assistance in search and rescue operations.

Their mobile rescue temas, equipped and trained to remove person from damaged buildings, will form an important part of their operations.

Aerial reconnaissance would be undertaken for the identification of people stranded in inaccessible places.

The Coast Guard would move in with boats for for rescue or for supply to people in marooned situations.

Search would be mounted by soldiers for locating endangered, trapped, disabled and isolated persons.

The disaster struck people would be moved to safety and administered first aid.

The seriously injured would be transported to the nearest health centre or hospital.

The whole search and rescue operation would be carried out with military precision to ensure that no one has been missed.

The Work Team Commanders would report to the National Emergency Operations Centre progress of their operations and requests for any additional assistance.

And the noble efforts of the Defence Force would be complemented by the Police, Fire and Prison Services, Red Cross and Volunteer organizations.

Heavy rescue may involve several tasks which require involvement of two or more teams working concurrently.

To clean landslides or remove debris heavy equipment may be required.

In some cases paramedics with life-support systems may stand by at a site to assist victims as soon as they are located - sometimes even before they can be extricated.

It is significant that search and rescue is a continuum of response. It is not only extrication, but emergency medical care in the field, and transportation to a place of care and safety.

Emergency plan of the country is thus designed for the exercise of "the military virtues" by the Defence Force, not for the physical warfare of one man against another, but for a sacred warfare for search and rescue of the endangered citizens.

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DISASTER RECOVERY PLANNING FOR FINANCIAL SECTOR

HURRICANE RISK

INTRODUCTION

I feel much like a Muslim who on the day of judgement finds himself in a heavenly garden graced with Chaste Maidens. Ladies and gentlemen, you may not be maidens - you may not even be chaste, but you are the dream come true of a Disaster Manager.

For almost three years that I have been the Director of the National Emergency Management Agency (NEMA) I have been dreaming of putting up a case for disaster mitigation as well as disaster recovery to the people who matter. For no amount of political will or executive efficiency can get the mitigation, rehabilitation and reconstruction projects moving without financial support which can only be provided by you. Today my dream has come true.

HURRICANE RISKS

Make no mistake about it. Contrary to what is generally believed, Trinidad and Tobago is vulnerable to all sorts of natural and man-made disasters and specially to hurricanes. The chart on the screen displays the occurrence of tropical storms and hurricanes in our hemisphere. This clearly shows that Trinidad and Tobago has a frequency of hurricane occurrences of 0.1 to 0.9 per year.

This does not mean that a fraction of a hurricane passes through Trinidad and Tobago every year, but rather a big hurricane can pass through our country every few years. And what hurricanes can do to our country can be best understood if we reflect on what Hurricane Fifi did to Honduras in 1974.

Hurricane Fifi arrived at dead of night on Wednesday, September 18, with winds of 140 miles an hour, and torrential rain. Two feet of rain fell in 36 hours. Although the hurricane winds caused the initial damage, they soon passed and the subsequent fatalities were mainly the result of the flooding. The heavy rainfall caused the many rivers of Honduras to overflow from their sources high in the mountains right down to the plains. Dikes and banks disappeared into a maelstrom of swirling brown water, and almost everything that stood in the path of the floods as they roared to the sea swept away.

The poorly built homes of the farmers and peasants disappeared. Even some of the sturdier houses were picked up and carried for several miles, and in some cases, when meeting an obstruction that even the roaring water could not move, would be piled one on top of another.

The final death toll throughout the country was set at least at 8,000.

The first aircraft from neighbouring countries and the U.S.A. began to drone over the devastated areas, spotting thousands of terrified and desperately hungry survivors clinging to anything that protruded above the vast wastes of frothy, surging water.

Some were soon saved, but the rescuers were unable to reach many of the rural areas of northern Honduras where thousands of peasants were marooned without food, fresh water or medical aid of any kind. To add to the difficulties, the only patrol refinery in the country had been isolated by the flooding of roads and the railway tracks, depriving the authorities of the fuel so vital for rescue work.

By September 23, helicopters from U.S. Base at the Panama Canal Zone were hovering wherever they could see signs of life, doubling their usual carrying capacity as they plucked wet, hungry and miserable survivors from roof-tops and trees. At first they were the only means of rescue, for bridges and railway tracks had been swept away and roads had disappeared beneath several feet of black, glutinous mud; electricity supplies were cut and telegraph poles were down everywhere.

Drinking water, food and shelter for the survivors as well as helicopters and boats for the distribution of relief were the most urgent requirements.In the recovery phase, replenishment of national food, security measures, restoration of damage infrastructure and rehabilitation of port and telecommunication facilities were necessary.

This is what a hurricane can do. But what is a hurricane? A hurricane is defined as a large non-frontal tropical depression or cyclone with wind speeds that exceed 119 km/hr (a tropical storm has wind speeds of 63 to 119 km/hr). The hurricane season is June through November, although 84 per cent occur in August and September. Hurricanes cause damage by their high winds, heavy rainfall, and storm surge. Winds up to about 162 km/hr cause moderate damage such as blowing out windows. Above that velocity winds begin to cause structural damage. Heavy rainfall can cause river flooding, putting at risk all structures and transportation facilities, and can also trigger landslides.

Storm surge is a rise in sea level due to on-shore winds and low barometric pressure. Storm surges of 7.5 meters above mean sea level have been recorded, and a surge of over 3 meters is not uncommon for a large hurricane. Storm surges present the greatest threat to coastal communities. Ninety percent of hurricane fatalities are due to drowning caused by storm surges. If heavy rain accompanies a storm surge, and the hurricane landfall occurs at a peak high tide, the consequences can be catastrophic. The excess water inland creates fluvial flooding, and the simultaneous increase in sea level blocks the seaward flow of rivers, leaving nowhere for the water to go.

The earth co-operates with oceans, sun, winds and indeed the solar system to produce a hurricane. Then should not all human beings work together to produce recovery from the disaster caused by a hurricane?

The economic sectors most likely to be affected by hurricanes are agriculture and tourism. The tourism sector in the Country is notorious for its apparent disregard of hurricane risk. Not only does a hotel built with insufficient setback risk damage by wave action and storm surges, the building also interferes with the normal processes of beach and dune formation and thus reduces the effectiveness of a natural protection system. Crown Reef Hotel in Tobago is one such example.

Once the risks are defined and quantified, planners and engineers can design appropriate mitigation mechanisms. Obviously, these are most cost-effective when implemented as part of the original plan or construction. Examples of effective mitigation measures include avoiding areas that can be affected by storm surge or flooding, the application of building standards designed for hurricane-force winds, or the planting of windbreaks to protect

crops. Retrofitting buildings to make them more resistant is a more costly but sometimes viable option, but once a project is built in a flood-prone area it may not be feasible to move it to safer ground.

At the national level non-structural mitigation strategies include campaigns to create a public awareness of warning services and protective measures, since informed citizens are more likely to check the condition of their roofs and other structures at risk. Our own campaing in this direction got periodically interrupted by events of July 27 in 1990 and December 15 in 1991. Taxation of investment in high-risk land is a potentially important strategy that has not been tried widely. Insurance can also be structured to encourage sound land use and structural mitigation actions. Among the important structural strategies are codes that control the design and construction of buildings and, in public works, the construction of breakwaters, diversion canals, and storm surge gates and the planting of tree lines to serve as windbreaks.

All these approaches may be effective in the urban settings where communications are good and institutional arrangements are firmly in place. But we do not have the resources to function effectively in areas of low population density when faced with widespread catastrophes such as hurricanes. The alternative here is to prepare local bodies to respond to emergencies by their own means.

Is your Organization ready for Disaster?

Emergency planning in general is divided into two main categories, internal and external. Each in turn is further sub-divided into the following categories:

Internal

(a) Departmental emergency training centre

if the building housing the EDPS centre is a weak structure and has windows exposed to strong winds there is a possibility that the building will collapse or exposed to harsh environment. A strongly structured building is a way of reducing the risk. Careful choice of a location for the facility in the core of the building could also provide added protection. The EDPS should also be protected from flooding by locating its site on high ground or a place not subject to flooding.

(b) Disaster recovery planning

External

(a) Continuity of Government

(b) National arrangements for disaster recovery.

The following steps are recommended for the process of developing a Disaster Recovery/Business Redemption Plan for your business function:

Step 1 - Assemble a list of activities that are performed in parts of your company's business or in other words the multitude of tasks carried out as an every day function.

Step 2 - Assign a priority to each activity using a scale of 1 - 5, one being top priority.

Step 3 - Develop planning objectives for the recovery of each identified task, for example:

(a) to provide complete computerized services within 14 days of the disaster or

(b) to provide partial computerized service within 14 days or full production within 14 days.

When these planning objectives are developed, keep in mind that recovery must maximise health and safety considerations to both clients and other employees. Take care also not to get trapped into planning for things that are not yours to plan.

Strategy for the Country's Disaster Recovery Planning

a. Designate a Disaster Recovery Task Force to give direction to long term recovery. Actions needed to establish this organization are to specify: sphere of responsibility during pre- and post-disaster periods; membership; procedures for activating the organization; and responsibilities of each member;

b. Conduct hurricane hazard vulnerability analysis to describe, at least in general terms, the population-at-risk, and the extent of damages to buildings and infrastructure to be expected for different locations. Such an analysis requires review of the best available information on location and magnitude of hazards, and, if possible, on structural characteristics of existing buildings. The information can be used to estimate probable damages from future storms.

c. Institute programmes to improve information base for making damage estimates for use in recovery planning.

d. Review existing building codes and compliance procedures for adequacy in relation to hurricane forces to assure safety. This step requires the updating of the Caribbean Uniform Building Code, particularly for small buildings, and the hiring of additional inspection staff. Such staff, however, should not be viewed as "enforcers" of the code, but as extension specialists who act as promoters and trainers of appropriate building construction practices. Further the code should not be viewed as "regulations", but as a guide for providing sound construction practices.

e. Define areas where new building construction should be prohibited for subject to special requirements to assure safety.

f. Establish retrofit priorities giving top priority to critical facilities, such as gas and electric lines, schools, water and sewerage, transportation, infrastructure, telecommunications and health facilities.

g. Prepare a loose-leaf binder containing information on potential sources of disaster recovery and instructions on how to apply for such assistance

h. Provide for training that brings together persons from different organizations that would be involved in the recovery effort. Such training (workshops, table top exercises) would also serve to establish new patterns of communication and cooperation, particularly among government and NGO staff, professional organizations in engineering, geology and architecture, among others, could play a useful role in such training.

i. Update National Disaster Plans on both islands to include a recovery component and to incorporate lessons learned from recovery experiences

j. When revising the disaster plans, participants should view a disaster as opening up a window of opportunity to do development work

k. Compile and maintain information regarding non-government organizations that are undertaking (or could undertake) development activity; establish and maintain contacts with such organizations.

l. To reduce disparities between the rich and the poor and to assure equitable distribution of aid, representatives of low-income communities should be encouraged to participate in disaster planning programmes.

Such involvement would enhance opportunities for the poor to share their response and recovery experiences, and to express their specific needs to others. This action assures that future disaster planning programs will integrate lessons learned from different segments of the population and thus account for their needs

m. Relief organizations should rely on local people and leadership whenever possible. Such reliance can facilitate long-term recovery and can improve the chances for occurrence of local developmental initiatives. Relief organizations should emphasize building-up human skills, and not solely rely on physical and material assistance.

n. Private sector should get more deeply involved in the national disaster planning programme. Private companies in many cases are well staffed and equipped to handle disaster response and recovery activities, as is the case of the insurance industry's potential involvement in monitoring the distribution and use of housing recovery aid.

o. Disaster recovery and development programmes should reach all social groups, particularly opinion leaders in each group. Such leaders are typically individuals who are willing to invest their resources--time, energy, and money--to assure that a particular issue is raised on public agendas. They can be a strong moving force in disaster planning.

p. Establish evaluation criteria to hold government and NGO relief activity accountable to long-term development standards. Such criteria would serve as a benchmark for monitoring and evaluation of impacts on development. Impacts could be measured based on mitigation, environmental protection or economic growth criteria, among others.

q. Set up a continuous system for monitoring progress toward sustainability. Monitoring the behaviour of various social, economic, natural resource and physical indicators to determine if sustainability is being enhanced or impaired. Such monitoring would also involve assessment of the performance of policies, laws, and other institutional arrangements.

r. Think of local people that experience loss from a disaster as "participants" in the recovery process, and not "victims".

s. Establish a public information program with communications aimed at various segments of the population. The program should relate national and global concerns to local situations, and should cover: information about hurricanes and their effects on the islands; updates on programmes and plans for recovery information for homeowners and businesses which describes assistance programmes and "how to" instructions for repair; continuous progress reports on major recovery problems and responses to such problems.

Preparation

An important role of the financial sector in the post-disaster period is to assist the government to sort out its own sectoral rehabilitation priorities and to co-ordinate financial support with other domes. Since it is a characteristic of rehabilitation projects that they should be quickly implemented, steps need to be taken to ensure that any rehabilitation project is implemented without delay by government and that the executive agency selected is able to fulfill its mandate. Also, special attention should be given to ensure a speedy and efficient flow of funds from the borrower to the agencies implementing the rehabilitation works and that the physical resources and supplies needed are promptly moved to the disaster areas.

National Structures

You may well ask what organizational structures have been set up in our country to deal with various aspects of disaster management. First, there is the National Emergency management Agency (NEMA) Task Force under the Director to deal with Preparedness, Prediction, Warning and Response. This Task Force comprises high level representation of Meteorological Service, Fire Service, Defence Force, Police Service, Information Division, Telecommunications Authority, Red Cross, Private Sector, Ministries of Public Utilities, Education, Energy, Foreign Affairs, Health, Works and Transport. As you will notice this Task Force has been drawn from various private and public agencies to form a homogenous team.

Second structure is a Technical Task Force to deal with hazard Analysis, Vulnerability Analysis, Mitigation, Prevention, Legislative Matter and Recovery. Members of this Task Force are drawn from the university of the West Indies, Water Resources Authority, Ministries of Agriculture, Lands and Marine Resources, Works and Transport, Planning and Development, Meteorological Department and Ministry of Labour Cooperatives, Chamber of Commerce, Insurance Industry and Association of Professional Engineers. This Task Force also carries out the function of the national committee for IDNDR (International Decade of Natural Disaster Reduction).

The Policy decisions concerning Emergency Management are taken by the National Emergency management Board which is presided by the Minister of National Security and has Ministers of Works, Health, Agriculture, Planning and Development, Housing and Settlement and Public Utilities as its members.

Conclusion

Important preconditions for successful disaster mitigation and recovery already exist in our country. All that is needed is a commitment from the private financial and insurance sector to play an active role in setting and implementing national goals for disaster mitigation and recovery for the remaining decade of nineties.

The Scottish Scientist J.B.S. Haldane once said that the people who can make a positive contribution to human progress are few, that most of have to be satisfied with merely staving off the inroads of chaos. You ladies and gentlemen, much like chaste maidens from Heaven, are uniquely placed both to make a positive contribution to human progress and to stave off the inroads of disasters.

MASS CASUALTY MANAGEMENT AS PART OF NEMA'S PLAN

There is an old Latin saying whose translation reads, I quote "Some remedies are more grievous than the perils" unquote. How mass management of casualties can be a heart-rending remedy after a disaster can be fathomed from a capsuled report of the London Hospital's, House Governor E.W. Morris, after dealing with the casualties emanating from a factory disaster in the east end of London on January 19, 1917.

6:50 p.m. - Loud explosion heard. Rather like loud short clap of thunder close overhead. Explosion immediately followed by people running and calling and falling of broken glass. Ran to telephone.

"Telephone supervisor much agitated at door of room but went straight back to instrument. Called up engineer. Could not get any reply from exchange for some time. Strong smell of burning; found this due to soot falling down chimneys and on to floors.

"Poplar Hospital rang up; reported enormous explosion; short of doctors; could we send any? Got five men and three lady doctors; cab of dressings; instruments; morphia; chloroform, etc.

"One cabman refused to go; abusive; was not going for anybody. Porter took his number. Gentleman in car, although ten miles out of London, drove to hospital at once and picked up dressers and dressings. Gave him some petrol.

"Police rang up. How many patients could we take in? Replied any number - 200 or 300 if necessary. Offered to arrange ambulance convoy. Heard motor ambulances already on spot.

"Engineers and orderlies worked hard to put the extra bedsteads from stores which we always keep for emergencies; got 100 up in an hour. Every ward full of beds and spare ones in corridors.

"Injured people soon came up in motor-lorries, butchers' carts - all sorts of vehicles. Treated about 60, and then a lull. Some very bad cases, and four died during the night. Injuries very terrible. Brought up on doors, shutters, etc.

"Children were brought up not always injured, but dazed. One child of eight with baby in arms and leading child of four. Couldn't find mother. Kindly driver picked them up in destroyed streets and brought them up with load of wounded in motor-lorry. Whitechapel Infirmary to the rescue - would take in any cases that simply wanted lodging.

"Bitterly cold admitting cases. Hot coffee made by gallon and doled out to drivers, police, porters, friends and orderlies.

"Admitted woman badly injured - her seven children killed. Also a father to Cotes Ward, mother to Yarrow Ward, children (four) to Queen Ward. Man came to look for sweetheart. Took him up. That case just dead. Took him to post mortem room with lantern - no, it wasn't she. Went away relieved.

"Little dog came up with fearfully injured woman. It wouldn't leave her. We let it in with her.

"The taxis returned. 'Could do nothing. Never saw such a night. A square mile blazing. Houses by the hundred a mass of bricks. Must be hundreds buried. Heat fearful. Could only get near by tying shawls round head. No good waiting.' All very upset at sight.

"No more admitted. Porters all worked overtime until 12. Orderlies excellent; their sergeant worthy of commendation.

"This morning (Saturday) very sad work. Relatives searching for wounded. Never seem to be here nor at Poplar Hospital, for we rang up to help the Ministry of Munitions in constant touch - but difficult to get names of injured. Came with friends and too ill to speak. Contents of pockets helped to identify. It was pay day and pay tickets in pockets of many.

"The hospital distinctly moved -a rocking movement. 231 windows broken. Somebody screamed. Otherwise no alarm. I beg to report most exemplary behaviour of all ranks. A dozen, at least, should be 'mentioned in dispatches'."

That report written in a hurry and under conditions of immense stress brings out some salient points which are characteristic of a mass casualty management situation which are as relevant today as they were 75 years ago.

Firstly, it is necessary that the wounded after they are rescued from a disaster scene, are subject to triage and proper records be made of the whereabouts of the wounded as well as the dead. In this way relatives searching for their dear ones will be spared the agony of running from one hospital to another.

Secondly, transportation of casualties need not be relied on the ambulance service alone. All sorts of vehicles available near the site can be used to carry injured people from triage area to the hospitals.

Thirdly, all hospitals should be flexible to cater for extra beds in their spare rooms even in corridors.

Fourthly, there will be great demand for doctors from the hospitals. A pool of doctors should be readily available to respond to these demands.

The management of mass casualties is a three part process. First involves search for victims and completing first-aid efforts. The second consists of transporting those victims who need further care to nearby health facilities. Finally if required, patients at those facilities must be selectively redistributed to other health care centres.

Search and Rescue

(a) Uninjured survivors need to provide most of the immediate help after a major disaster strikes us. The need for search, rescue and first-aid efforts is likely to be so great that organized relief teams can meet only a small fraction of the demand;

(b) Search and rescue operations and treatment of the injured are critical within the first three days. The outcome of medical emergencies is determined within 24 hours after a disaster occurs. Over the course of this period, the injured are likely to present themselves at a health care facility in two distinct ways. The earliest to appear are those individuals injured in the immediate vicinity of the facility. Later on, those detected by members of relief teams arrive, as the teams become organized in more distant regions. After these have been treated, the need for medical assistance returns to usual;

(c) Treatment is usually urgently required within the immediate aftermath before it arrives from outside the site. It is inevitable that the local survivors of a disaster provide most of the essential medical assistance during that time. Therefore, updated urgent relief plans and personnel trained to carry them out, should exist in all high risk areas;

(d) Recording identification of the dead and injured is vitally important. ID of dead would be necessary for family to be able to benefit from any life insurance, probate and other legal matters. Accurate records of the disposition of the injured and displaced are essential for the reduction of anxieties of relatives. Records also help to save lives in future emergencies, in so far as the analysis leads to the enhancement of disaster preparedness.

(e) Mobile medical teams may be sent to the Disaster site to attend to the gravely injured. Such a team is of value only if some victims are trapped or if the hospital is at a considerable distance from the site of the disaster.

Transporting Victims

(a) Before any victims can be transported it is necessary that "triage" i.e. sorting and classification of victims, is carried out. A point will have to be selected near the disaster area which will serve as triage area as well as the place from where casualties are transported;

(b) Radio communications from volunteer organizations would be required at this point to arrange calling in all ambulances/cars for evacuation of casualties;

(c) Two routes will have to be designated by the Police for casualty evacuation - one for carrying the casualties to hospitals and the other for empty vehicles reporting to the triage point;

(d) All available ambulances from Ministry of Health, Red Cross, St. Johns Ambulance and Fire Service would be called to the site by the Senior Medical Co-ordinator. If additional transport is required, arrangement will be made by the Transport Co-ordinator to NEMA. It is expected that members of service organizations will help with their cars.

(e) Red Cross or first-aid personnel would be involved in transporting casualties from triage area to the nearest health facility.

Redistribution to other Health Centres

(a) Prior thought must be given to the redistribution from nearest hospitals of current inpatients, some of whom can be expected to be ambulant. This process will be part of the initial hospital response - for it is very unlikely that first patients from the disaster areas would reach the hospital in less than 30 minutes;

(b) Consideration should be given to immediate discharge of suitable patients if it seems that the number of admissions will require this. Patients who might be considered for immediate discharge are those due to go home in the next 48 hours, those living near the hospital and whose relatives are available by telephone, and those admitted for only routine investigations;

(c) Further expansion of medical care capacity in the nearest hospital can only be accomplished in two ways: by importing more medical assets, or by exporting patients to other unaffected areas;

(d) Supplemental medical care stations may be required to relieve the burden on hospitals. These may be created by expanding the capacity of existing hospitals, clinics or health centres, or may be set up independently at sites convenient to patients or rescue workers. Supplemental facilities are essential to care for the hundreds of victims of catostrophic incidents;

(e) There may not be enough hospital beds in the affected area for a substantial number of seriously injured patients. Patients then must be evacuated to hospitals in unaffected areas. This usually is accomplished by a combination of extemporized ground transportation and helicopters.

Conclusion

French Prime Minister during World War I, Clemenceau had once said that war is too serious a business to be left to Generals alone. Might I take the liberty of paraphrasing those words by saying that Mass Casualty Management is too serious a business to be left to Doctors alone. Rather many of the groups from the NEMA Task Force would be required to work closely to ensure that casualties receive the best possible treatment in the shortest possible time. These groups would be from Local governments, Red Cross, St. John's Ambulance, Radio Clubs, Service Clubs and other Non-government organizations, Police Service, Defence Force, Fire Service and the National Helicopter Service.

It is hoped by the end of this Seminar we would have cleared our minds to a certain extent as how to implement the three-part strategy of mass casulaty management which is: First, field medical care resources locally avaiable to triage and stabilize victims should be augmented by outside medical teams. Second, patients who need inpatient care and cannot be accommodated in local or regional facilities should be evacuated. Third, adequate hospital facilities should be made available at destinations for definitive treatment of evacuated patients.

"Where shall I begin please, your Majesty?" a presenter asked "Begin at the beginning", the king said gravely, "and go on till you come to the end: then stop." I don't know whether I began at the beginning but I am certain that I have come to the end of my presentation and therefore I stop here.

Thank you ladies and gentlemen.

RESPONDING TO CHEMICAL DISASTERS

Presence of oil and asphalt in our own country has given rise to a number of industries which deal with chemicals. A range of hazards, though unsought, are inherent in the activities of these industries.s These hazards can become disasters if they cause damage, injury or loss of life or property with which the community canot cope and during which the society may undergo severe disruption.

Unfortunately, nothing much has been done in the country for prevention and mitigation of chemical disasters. That is why when I was asked to make this presentation I seized the oportunity so that NEMA could have better contact with the chemical industries of the country. A late start in this direction is a matter for regret, but not for dispair. What is needed at this stage is full co-operation from groups like yours. Disaster prevention is not merely the preserve of technical centres but all interested groups like yours.

By evaluating the risk to which we are liable in the case of chemical disasters it becomes practical to plan and implement the means of protection in any economical manner.

First step in prevention and mitigation has to be incorporating disaster preparedness and management in all development relating to industries dealing with chemicals. Proper measures should be taken at the feasibility study stage - the cost of which, however high it may sometimes appear, is from one-tenth to one-hundredth of the cost, both direct and social that will result from the same disaster if it was passively endured.

Second step should be to constitute a high-powered committee of expert engineers drawn from all sectors to examine all the industrial facilities whose failures would not only affect the plants but the population in surrounding areas.

You would now be ready for the evaluation of risk and investigation of disaster potential which can be done in four phases.

Firstly, hazard assessment. In this phase physical characteristics of the hazards are established. This includes information on intensity and points of impact. Hazards which should be taken into account are explosions and leakage of poisonous gases.

In the second phase an inventory of elements at risk should be drawn up. The stage is now set to carry out vulnerability analysis of elements at risk. In this phase, the structural integrity as well as functional capabilities of the various elements should be reviewed in relation to the potential impact of their hazards.

A study of the likely consequences of the impact should lead to estimate of expected damage and interruption of the industry, critical facilities, housing areas and other economic activities.

In the last phase mitigation strategy should be formulated and projects identified to reduce vulnerability of the identified critical elements.

It is much better to have these studies carried out now and preventive measures taken rather than find ourselves in a situation similar to Seveso where the only expert solution was "To burn down the entire poison zone." NEMA is prepared to assist your organization or any industry in carrying out these studies.

Response to any disaster would depend on the preparedness, that is why four organizations have been developed to ensure preparedness of the country to confront any disaster, be it natural or industrial.

Firstly, there is a County Co-ordinators Committee which has to ensure preparation of regional plans and co-ordination between counties/boroughs. The regional plans have been made out and plotted on maps which will be soon distributed to all interested groups. The maps show vulnerable areas (including industries), location of shelters and health centres, routes of evacuation, location of resource and telephone numbers of key personnel.

A task force has been constituted under NEMA which involves almost every sector of the community and much of the work is delegated to task groups which are assigned specific tasks. Resources of fire service, police service, defence force, Ministries of Works, Infrastructure and Decentralization; Health; Industry, Enterprise and Tourism; Energy; Settlement and Public Utilities, Information and Telecommunications Division of the Office of the Prime Minister and non-governmental organizations are utilised to constitute these task groups. But this plan will work only if the general public is sufficiently well informed to participate actively and effectively. In emergencies there will arise a wealth of unforeseen contingencies in which individual members of the public will need to exercise initiative and display their resilence and resourcefullness. That is why the plan of this task force has been published in booklet and distributed widely for public information.

Under the task group of marine pollution, oil spills and hazard materials headed by the Ministry of Energy comes the control and response to industrial disasters. This task group has resources of oil companies at its disposal. Recently there has been a bilateral agreement between Trinidad and Tobago and Venezuela where either country can seek help from the other for disasters relating to shipping and oil spills.

Discussions are at present going on within the CARICOM Countries to establish a CARICOM Disaster Response Mechanism which will mobilize assistance from the CARICOM to any CARICOM Country afflicted with any disaster. The agency will have centres in these locations - Jamaica, Barbados and Trinidad. This Mechanism is likely to be in place in early 1991.

To help shape policy, to assist the Director of NEMA during emergency situations and to ensure good co-operation from the many agencies that will play a role in preparedness, response, recovery and mitigation, an emergency management board has been appointed by the Prime Minister. The Board is headed by the Prime Minister and includes the Ministers of Food Production and Marine Exploitation; Justice and National Security; Works, Infrastructure and Decentralization; Settlement and Public Utilities; Planning and Mobilization and the Environment and National Service as its members.

The heart of disaster preparedness will be the Emergency Operations Centre which has been established at Whitehall Annexe and which will be duplicated at Wallerfield. On receipt of any warning given by an industrial or regional co-ordinator, the national and regional EOC's would be brought to the highest state of readiness. The EOC will supervise warning systems, keep the population informed, decide on whether and when to evacuate certain areas, direct and control relief workers and keep the media in the picture.

Positive thinking may be a good thing for achieving most guidelines in the world: But for disaster preparedness a case can be made out for negative thinking and as Voltaire said once, "Its attendant virtues of challenge, self-doubt, mutual acceptance and toleration." These virtues have to be made known to the managers in the industrial sector.

Emergency response activities are those which are carried out during the actual emergency or immediately prior to it. This may involve evacuation of certain communities, emergency assistance during the disaster and actions taken in the immediate aftermath of the disaster. Because emergency period is both dramatic and traumatic, most attention by the Press and international community is focussed here. Yet in most disasters the emergency passes rather quickly and, in reality only accounts for a very small percentage of the total picture. In this period both employers and employees of an industry can perform services which cannot be performed by anyone else. The information which you pass as "fire watchers", survey reports that you can relay to the EOCs and the guidance you can give to search and rescue teams can make all the difference in saving lives and protecting property. Being at the disaster site you can help in rendering first aid and opening of escape routes.

In almost any major industrial disaster it becomes necessary to move people from a dangerous area to one that is safe. We have already finalized plans for evacuating from dangerous areas in each community to comparatively safe shelters. In addition to preparing the maps which I have already described earlier, the plans also cover transport arrangements, traffic control and health care. Red Cross has been given the task of providing food and clothing for evacuees, while shelters will be managed by school principals.

Other activities which will take place during this stage are survey and damage assessment, search and rescue, traffic control and road clearance. In all these activities NEMA's task groups will be reinforced by volunteers from non-government organizations. It is the time when lives will be saved by the dint of old fashioned virtues of courage, loyalty, character and determination and will.

Post disaster activities can be divided into two phases. The first begins at the end of the emergency phase. It is a transitional phase when people and the industry re-establish a semblance of normalcy. This period is usually characterised by such activities as reopening of the industries in damaged structures, people returning to their homes and resumption of basic infrastructural services such as water, electricity, sanitation and telephone services.

In this phase the affected industry and the public utilitiess would have to work with a sense of purpose to ensure that the industry does not suffer a prolonged breakdown.

Reconstruction phase would be marked by large scale constructions to replace damaged buildings and restoration of the industry to its full pre-disaster production acceptance. In fact, the opportunity can be utilised to carry out development projects for creating better infrastructure.

All sectors of the country would have to be prepared in responding to the disastersif we are to prevent chemical hazards from becoming gruesome catastrophes.