Nevis Disaster Management Department

The Nevis Disaster Management Plan.

(Draft for revision by the NDMD and stakeholders)

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CHAPTER 1 General Information.

1. Introduction.

Disaster Preparedness means preparing organisations and the community to react to promptly to save lives and protect property if it is threatened or hit by a disaster or major emergency of any kind. In order to do this, planning must be done before there is even the threat an emergency. This involves the assignment of responsibilities, classification and cataloguing of resources, training, practice drills and evaluation of experiences.

The role of the Nevis Disaster Management Committee as stated in this plan must not be seen simply as that of rendering "help after the storm or eruption". Instead, its role is one of activating the community on countrywide basis to deal with any type of disaster. The function of the planning and response organisations with respect to emergencies can be divided into five categories:

Informing – The development and dissemination of information which will enhance the capability of the individual or the private organisation to cope with emergencies, to get help when needed.
Warning - The analysis and forecasting of the nature of potential emergencies and the development and operation of systems designed to maximise warning time and precision for the benefit of both victims and helpers.
Coordinating - The development of systems to enable resources to be effectively applied to emergencies.
Providing - The provision and maintenance, when necessary, of extra-ordinary resources as well as the diversion of normal resources to meet emergency needs,
Evaluating - The review of the performance of the Committee with a view to its improvement.

Disaster Preparedness and planning are continuous exercises; it is a year round preoccupation not only for members of the Nevis Disaster Management Committee and the Emergency Sub-Committees, but also for every citizen. Government agencies and private organisations alike are required to prepare their own internal disaster plans and these must be reviewed every year in order that they are kept up-to-date.

It is, therefore, the responsibility of every citizen to become familiar with the Nevis Disaster Management Plan and to be so versed in the roles which he/she is expected to play in the event of a disaster that, should action be necessary, the response would be instinctively orderly rather than merely a panic-stricken reaction. Everyone must be involved in increasing the country's degree of preparedness. Everyone must see him/herself as a disaster worker.

The plan involves the mobilisation of human and material resources of the island in planning, training and managing the various aspects of a disaster or major emergency in order to return the island to a state of normalcy as quickly as possible. It includes:

a. The establishment of the Nevis Disaster Management Committee
b. The structure of the various Emergency Sub- Committees
c. The roles and functions of Government Ministries and key Departments, Public Utilities, Statutory Bodies, non-governmental and other voluntary organisations
d. The roles and functions of all agencies before, during and after a disaster.
e. The emergency telecommunications network.
f. The establishment and operation of early warning systems
g. The assessment of damage and needs.
h. The co-ordination between the various sub-committees within the organisation.

A key component for the successful implementation of the Nevis Disaster Management Plan is a continuous public information and education programme to foster the awareness of the public to the roles which they can play in preventing, mitigating and dealing with disaster situations.

2. Purpose.

The purpose of the Nevis Disaster Management Plan is to guide the National Disaster Management Committee, the Emergency Sub-Committees, the District Emergency Committees and all stakeholders and organisations involved in disaster preparedness, response and recovery in Nevis to be prepared to respond timely and adequately in the case of the threat and/or impact of a specific hazard in the country.

3. Objective

General: To protect Nevis and its people, institutions, infrastructure, services, resources, environment and economy in the case of the impact and consequences of natural and man-made hazards.

4. Types of Hazards

All hazards can be grouped into the following categories:

Origin	Natural	Man-Made
Geological	Earthquake Volcanic Eruptions Tsunami Landslides	
Hydro-Meteorological	Tropical cyclones (hurricanes and tropical storms) Heavy rainfall Floods Storm surge Droughts	
Chemical	Hazardous materials: Explosions Spills Gas leaks	
Health-Environmental	Epidemics Food poisoning Air pollution Water contamination Soil contamination Noise pollution Destruction of habitats Endangerment/extinction of flora and fauna	
Social-Organisational		Power failure

		Civil strife Terrorism Aircraft crash Shipwreck Major road accidents Construction failures Interruption of public utilities Invasion Mass gatherings Demonstrations Strikes
Radioactivity		Nuclear accidents. Accidents involving medical equipment and others containing radioactive material

Many or all of these hazards can occur in Nevis; therefore, organisations must plan to be better prepared to respond should any of them threaten or impact the country.

Four of the most destructive hazards due to their magnitude, destructive potential and scope of impact are the following:

Hurricane

The official hurricane season in the Gulf of Mexico, the Caribbean Sea and the Atlantic Ocean runs from 1st June to 30th November. However, the record shows that hurricanes have occurred outside of this period. It is important that the public should be well advised of precautions to be taken before the actual hurricane season as well as those to be taken during the occurrence of a hurricane or in the aftermath of any such disaster.

Volcanic Eruption

A volcanic eruption involves the escape at the surface of molten rock (magma) which has risen from a zone of melting several tens of kilometers below the surface. The magma generally contains a much larger volume of gas than liquid and the gas, before it emerges at the surface, is under very high pressure. The more gas present, the more violently explosive will be the eruption. Volcanic eruption can occur at any time of year.

Nevis Peak on the island of Nevis poses constant threat to the population. It is equally important that the public be aware of the measures to be taken in the event of an eruption.

Earthquake/Tsunami.

An earthquake is a sudden release of energy produced by the natural movement of the tectonic plates. The energy moving the ground produces the movement of structures that could collapse them with the subsequent destruction of housing and infrastructure besides dead and injured. An earthquake can produce a tsunami that could cause severe damage particularly to coastal areas.

See Appendices A, B and C of this plan.

5. Vulnerable Systems.

The term 'system' refers to an assemblage of certain elements (or subsystems) operating within a prescribed boundary and united by some form of regular interaction or interdependence to form a coherent and integrated whole that has also certain specific purposes.

According to the definition, anything can be considered as a vulnerable system: a region, a city, a District, a group of buildings, a bank, an industry, a house, a car, a computer and even the human body; and they are all susceptible of being damaged by internal or external hazards.

In our case, Nevis is to be considered as a vulnerable system. It is vulnerable to the impact of hazards.

5.1. Vulnerable System Elements

We shall identify five elements of the Vulnerable System (considering Nevis as the Vulnerable System):

1.-Population
2.-Facilities/infrastructure
3.-Services
4.-Information
5.-Environment
6.-Economy

1.-Population :

-Human lives: men, women, children, elders, citizens, tourists, the handicapped, prisoners: all human beings disregarding their political, legal and social status and disregarding their physical and psychical conditions.

2.-Facilities/Infrastructure/Services :

- Housing: Houses, dwellings, apartments, hotels.
- Education: Schools, college. Other institutions.
- Water supply: Water storage and distribution.
- Health services: Hospitals, Clinics.
- Industry and commerce: Industries, commerce, shops.
- Food supply: Food supplies. Commerce, markets. Food production, storage and distribution.
- Communications: Roads, port, airport.
- Telecommunications. Telephones, radios. TV and Radio Stations.
- Transport: Public and private. Land, maritime and air.
- Energy (power supply, fuels, etc): Fuel storage and distribution, petrol stations.
- Sewage: Sewage systems.
- Agriculture: Crops.
- Religious: Churches. Temples. Synagogues. Mosques.
- Livestock. Animals.
- Security: Defence Force, Police, Fire Service, Coast Guard.
- Waste Management and disposal. Accumulation of garbage. Interruption of garbage collection.
- Cultural, Historical, Tourism: Tourist and historical sites and monuments. Beaches. Resorts.
- Financial: Banks. Insurance companies.
- Entertaining/ recreational: stadium, etc.
- Administrative: Every governmental and private office building.

3.-Information :

-Archives.
-Libraries.
-Documents, files, records etc.

4.-Environment :

-Fauna.
-Flora.
-Water.
-Air.
-Soil.
-Natural resources.

5.-Economy :

-Direct cost. (cost of damage)
-Indirect cost. (cost of productivity and lack of income, insurance, fines and sues, loss of revenue, loss of taxes, etc.)
-Recovery cost. (cost of reconstruction)

An important point to be highlighted here is that sometimes emergency management agencies have the assumption that emergency facilities and responders will not be affected by the impact of hazards. This is not a valid assumption; most of the times emergency personnel, facilities and equipment are affected by the impact of hazards: hospitals, transportation, airports, etc., are affected and reduce the response capacity of an organisation and of the country itself.

6. Main hazards that have impacted Nevis.

The following data includes past disasters in St. Kitts that have been likely to affect Nevis. For a complete list of hazards in St. Kitts-Nevis, check the NDMD website: http://www.nevisdm.com/

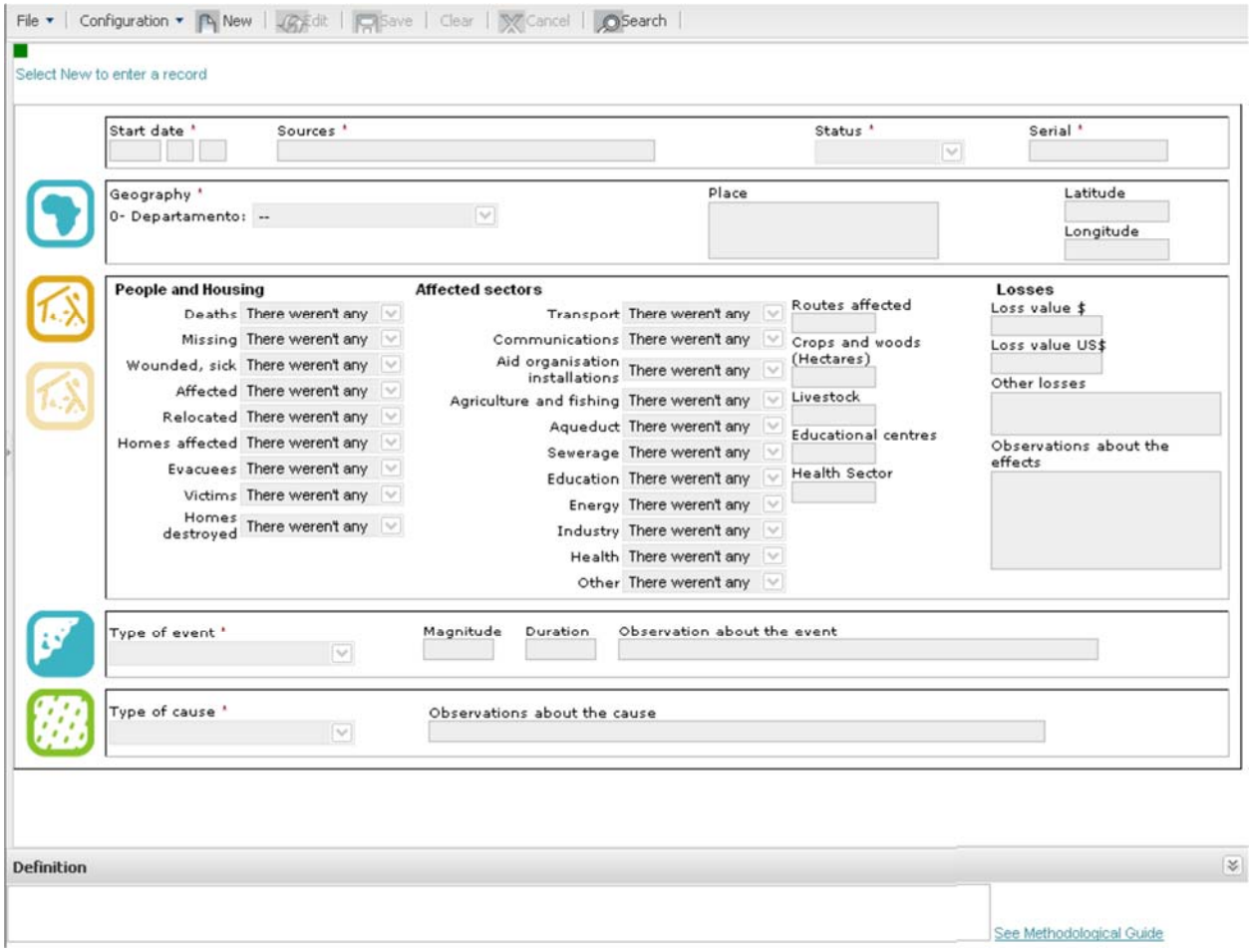
1642:	**A hurricane destroyed all the houses on the island of St. Kitts**
1667:	**A hurricane destroyed all the houses on the island of St. Kitts**
6th April 1690:	**An earthquake caused serious damage throughout St. Kitts & Nevis** **First hand details of 1690 Earthquake** **St. Kitts** – There were cracks in the ground as wide as 9 feet in some areas. The Jesuit college and other wooden structures collapsed. **Nevis** – The sea was disturbed and a tsunami appears to have affected Charlestown.
10th April 1690:	**Jamestown, former Capital of Nevis, reportedly destroyed** by an earthquake & subsequent Tsunami at 5 pm
31 Aug 1772:	**Hurricane caused £500 000 worth of damage on St. Kitts** (The cost in 2010 E.C. dollars must be close to 2.5 billion)
4th Sept 1776	A fire caused significant loss of property in St. Kitts. It was followed only a day later by a hurricane.
1790	Major flooding torment the inhabitants of Basseterre.
9th Sept 1821	Destructive Hurricane
17th Aug 1827	Destructive Hurricane

12th Aug 1835	Destructive Hurricane
1833	Dreadful Earthquakes affected Nevis
October 1836	**MV Clarendon** while travelling from Basseterre, St. Kitts to England with cargo of rum, sugar, arrow root, coconuts and turtles, sought shelter in Portsmouth a fter crossing the Atlantic but without success. The ship had encountered strong winds while crossing the Atlantic. The ship sunk when it came under hurricane force winds while trying to get to Plymouth for shelter. 13 sailors and 10 passengers perished with 3 crewman saved
8th Feb 1843	**Earthquake affecting Nevis** - Charlestown Court House to the ground. Bath house much damaged. Custom House partly down and all the Mills in the island more or less injured, nearly the whole of the town destroyed, most of the wood built houses are left standing, all the stone buildings are so injured that they must be taken down and rebuilt, estimated damage at £50,000 only 2 Mills on the island that can be worked.
1854:	**Cholera Epidemic** - It was estimated that one sixth of the population died from the disease. **3,920 persons died in St. Kitts and 891 in Nevis.**
21st Aug 1871	Destructive Hurricane
12th Sept 1876	Destructive Hurricane
7th Aug 1899	Destructive Hurricane
28th Aug 1924	Destructive Hurricane
13th Sept 1928	Destructive Hurricane
1948:	**M.V. Crown sank** in the Caribbean sea while travelling from Nevis to St. Kitts with a crew of eight, captained by Elenezer Hicks. Three crewmen drowned and the boat was not found. **Poem by Marcella Queeley Jones**
1950's :	**Severe earthquakes** strike St. Kitts & Nevis
1950's :	**M.V. Lady Nisbett and M.V. Enterprise mishap/accident** (details being sought)
1st Aug 1970:	**M.V. Christena Disaster** (227 persons die in boat incident in the Narrows, between St. Kitts & Nevis)
1974	An earthquake of magnitude 7.5 struck the Leeward Islands causing significant damage. **St. George's Anglican Church damage**
17th Sept 1989:	**Hurricane Hugo** impacts St. Kitts & Nevis (details to be posted)
5th Sept 1995:	**Hurricane Luis** impacts St. Kitts & Nevis (details to be posted)
15th Sept 1995:	**Hurricane Marilyn** impacts St. Kitts & Nevis (details to be posted)
21st Sept 1998:	**Hurricane Georges** impacts St. Kitts & Nevis (details to be posted)
18th Nov 1999:	**Hurricane Lenny** severely damages the Nevis coastline, Four Seasons Hotel, Deep Water Harbours (St. Kitts & Nevis)
Oct 2008:	**Hurricane Omar** severely damages the Four Seasons Hotel causing the Hotel to be closed for more than 1 year.

7. Disaster Database.

It is important to keep records of emergencies and disasters including the effects caused on the vulnerable elements. It is important to have a database with this information that will help focusing the disaster management process.

This should be the overall responsibility of the NDMD. Databases and software like DESINVENTAR (http://www.desinventar.org/es/software/doc/DesInventar_User'sGuide_8.1.9.pdf) could be used for this purpose. See figure with information below:



8. Mapping.

Disaster management mapping is a key activity by which organisations can know where hazards can impact with different magnitude and what vulnerable elements could be impacted or destroyed. Possible scenarios can be analysed and, consequently, disaster management activities could be planned and implemented such as mitigation, land use, etc., and, at the same time, emergency response plans and activities could be better focused should the disaster scenarios occur.

Key maps that should be developed include: hazard maps; vulnerability maps (vulnerability to specific hazards: hurricanes, floods, earthquakes, tsunami, volcanic eruptions, etc.); risk maps (frequency of the occurrence of hazards), and disaster scenarios (damage to vulnerable systems by specific-magnitude hazards). GIS should be used for these purposes. Maps should be updated regularly.

9. Legal Framework.

The Legal Department of Nevis will advise on issues such as:

1. Emergency powers.
2. Declaration of a state of emergency/disaster and implications.
3. Forcible evacuation.
4. Requisition of vehicles, goods and materials during emergencies/disasters.

5. Adoption and

10. Certification of Buildings and Businesses.

In order to ensure buildings are hazard-proof and the organisations and personnel within them are prepared to respond to hazards' impacts, a certification process should be implemented. In order to have buildings, schools and businesses certified, it must be ensured:

1. Their personnel are aware of hazards and risks that could affect them.
2. Their personnel are trained in first aid, fire prevention and control, means of evacuation.
3. Equipment and materials to be used in emergencies are operational and in good working conditions: generator, first aid kit, fire extinguishers, etc.
4. Drills are conducted regularly.

Guidelines and a system for training and verification of the level of preparedness should be developed by the NDMC. This would allow all buildings (governmental and private) and their personnel to reduce risks and to respond timely and adequately in order to protect their personnel and assets.

CHAPTER 2 Institutional Framework.

11. The Nevis Disaster Management Committee. (NDMC).

The general direction and control of the Committee resides with the Honourable Premier of Nevis.

Members :

The membership of the Committee is as follows:

1. Honourable Premier – Chairman.
2. Permanent Secretary, Premier's Ministry - Deputy Chairman
3. Director – Nevis Disaster Management Department - Secretary
4. Legal Adviser. Nevis.
5. Permanent Secretary, Agriculture, Lands, Housing, Cooperatives & Fisheries
6. Permanent Secretary, Physical Planning Natural Resources and Environment/Communications Works, Public Utilities and Posts.
7. Permanent Secretary, Finance
8. Permanent Secretary, Education & Library Services
9. Permanent Secretary, Tourism.
10. Permanent Secretary, Health, Gender & Social Affairs
11. Permanent Secretary, Social Services, Youth, Sports, Community Development and Culture.
12. Medical Officer of Health
13. Superintendent of Police. Divisional Fire Officer (Nevis), Fire & Rescue Services.
14. St. Kitts-Nevis Defence Force
15. Customs.
16. Press and Government Information Officer
17. Director of Physical Planning, Natural Resources & Environment
18. NASPA
19. Meteorological Office.
20. Manager. Water Department.
21. Environmental Health. Nevis Solid Waste Management Authority.
22. Manager, Nevis Electricity Company Ltd. (NEVLEC)
23. Representatives, Telecommunication companies: Lime, Caribbean Cable, Digicel, Chippie, Windstream.
24. Representative, Red Cross Society
25. Adventist Disaster Relief Agency
26. Christian Council. Representatives of other faiths.
27. Representative, Chamber of Commerce (Nevis Chapter)
28. Representative, Lion's Club
29. Representative, Rotary Club

Functions.

The main function of the Nevis Disaster Management Committee is to ensure that the island is in a state of preparedness at all times. Its areas of planning will include:

1. Collaboration with the Nevis Disaster Management Department. .
2. Co-ordination of the activities of District Emergency Committees in the island.

3. Ensure warning systems, warning dissemination, responsibility for and control of local broadcasting.
4. To ensure the design of disaster plans
5. To identify emergency shelters.
6. Identify transport and equipment requirements for emergencies.
7. Make arrangements for relief aircraft and ships, including customs clearance for relief supplies and personnel.
8. Ensure storage and control of relief supplies and equipment.
9. Conduct public relations, informing the general public and international organizations about matters related to disaster management in Nevis.
10. To hold a 'pre-impact meeting' of the Committee before the impact of hurricanes with all members to ensure all sub-committees and the population are informed about and ready for the impact of a storm.
11. Conduct emergency public information and press briefings.
12. Vet and approve disaster management reports.
13. Direction of labour during emergencies.
14. Regulate the entry control of non-essential visitors.
15. Advise the National Emergency Management Agency on the requirement for anticipatory orders under the Emergency Powers Act. (Advice PM sanctioned by GG)
16. Arrange special reconnaissance in damaged areas and receive reports to make decisions for response and recovery.
17. Approve post-disaster demolition and repairs.
18. Conduct the reconstruction of impacted areas.

All correspondence concerning the Nevis Disaster Management Committee should be addressed to:

The Secretary.
Nevis Disaster Management Committee (NDMC).
Premier's Ministry.
Charlestown.
NEVIS.
Website: http://www.nevisdm.com/

12. Emergency Management Sub-Committees.

For the better planning and implementation of specific emergency response functions, Emergency Management Sub-Committees have been created.

It is recommended that Sub-Committees select Deputies in most cases. The Director NDMD/Secretary NDMC (or his nominees) is a de-facto member of all Sub –Committees. As such, the Director should be invited to all meetings and receive all minutes from such meetings.

The ten Emergency Sub-Committees of the Nevis Disaster Management Committee are the following:

1. Public Information and Education Sub-Committee
2. Housing & Shelter Management Sub-Committee
3. Land Search and Rescue Sub-Committee
4. Medical & Health Services Sub-Committee

5. Utilities, Transport and Equipment Sub-Committee
6. Damage and Needs Assessment Sub-Committee.
7. Emergency Supplies Sub Committee
8. Seismic/Tsunami/Volcanic Sub-Committee
9. Environmental Pollution Sub-Committee
10. Tourism Sector Sub-Committee

Their composition and general functions will be described below:

13. **Public Information and Education Sub Committee**

Members:

Public Information

1. Director, Government Information Service - Chairperson
2. Deputy to be the person acting for the Director
3. Director Community DevelopmentHead of Project Management and Training Unit.
4. Head of Information & Technology Department.
5. The Medical University of America.
6. Representatives, Radio & Television VON//NTV/INFOCHANNEL/TBN? Choice Community Radio. Praise FM.
7. Representatives, Print & Electronic – Observer/Leeward Times//Newslink/Nevis pages(Internet)/
8. Radio/Ham Operators PresidentCEO NEVIS Tourism Authority
9. Police (Public Information Section)
10. Representative Ministry of Tourism
11. Telecommunication: Cable Lime/Digicel
12. Church (Chairperson of Nevis Christian Council)
13. Social groups: Lions, Rotary
14. Chamber of Commerce

Education

1. Library Service (Director)
2. Ministry of Education (To be specified)
3. Health Educator
4. Chamber of Commerce
5. Church (Chairperson of Nevis Christian Council)
6. Social groups: Lions, Rotary

Functions

Public Information Sub - Committee (including emergency public education)

Normal times

1. Assisting, coordinating and developing information for dissemination about disaster management.
2. Organisation of on-going public awareness and education programmes on all types of disasters as well as preventive measures to be taken.

3. Receive information from other sub-committees / organizations to be disseminated about disaster management.
4. Dissemination of disaster preparedness information, and planning dissemination of information during and after a disaster.
5. Ensure reliability of information disseminated.
6. Identify novel ways to communicate disaster preparedness.
7. Expand the perception of hazards: earthquakes, tsunami, floods, etc.
8. Promote the use of the NDMD website and the social /multimedia use for disaster information (facebook, twitter)
9. Develop public awareness material and activities: jingles, dramatisations, plays, film contest, debates, competitions, etc.
10. Develop material for children use regarding disaster management; e.g. comics, cartoons, colour books, feel and touch games, puppets, etc.
11. Organise disaster preparedness talks in schools
12. Use the school audio visual programme for dissemination of disaster preparedness information. (clips, etc.)
13. Continue Disaster Awareness Day(s)/Week(s) and determine the best time to hold them including the specific subject (earthquake, hurricane, tsunami, general disaster preparedness, etc.). Involve the National Committee and the Sub Committees in their planning and execution.
14. Plan and execute a national warning test through all the media and means of communication testing all alert systems on a particular day and particular time.
15. Arranging for training of disaster personnel at all levels.

Emergency and disasters.

1. Alerting the population of any impending disaster and precautionary measures to be taken.
2. Use of text message to all users to alert the population of the impending impact or occurrence of
   a hazard.
3. Inform about precautionary and safety behaviour measures in the case of accidents and sudden and unpredictable emergencies and disasters. (What to do, avoid routes, etc.)
4. Gather and disseminate information during emergencies and disasters
5. Support in the generation and dissemination of information during emergencies and disasters from the EOC.

<u>Education.</u>

1. Message formulation sessions based on the target audience (children, elderly, adults, etc.)
2. Ensure disaster management is included in the curricula of social studies, geography, etc. in primary school and high schools. Enhance it as necessary.
3. Planning education activities from pre school to senior citizens, community centers.
4. Plan and conduct drills in schools involving teachers, parents and community as necessary and for different hazards.
5. Promote disaster preparedness interactive discussions, talks, lectures, demonstrations, etc.
6. First aid training (a day or half a day) in the school system in pártnership with Red Cross.

14. Housing & Shelter Management Sub-Committee

Members:

1. Permanent Secretary, Education & Library Services – Chairperson
2. Deputy - Principal Assistant Secretary, Community Development
3. Director, Public Works Department
4. Project Management and Training Unit.
5. Representative, Police Department
6. Senior Environmental Health Inspector
7. Manager, Housing and Land Development Corporation
8. Representative of Red Cross Society
9. Adventist Disaster Relief Agency
10. Representative of Nevis Christian Council
11. Representatives of other faiths: Muslim, Jewish, Baha'i, Hindu and Rastafarian.
12. Representative Lions Club
13. Representative Rotary Club
14. Representatives of other service clubs and NGOs.

Functions

1. Assist in selection and identification of suitably safe buildings for use as emergency shelters, including private buildings (including identifying alternate shelters)
2. Identification of emergency shelters for the benefit of the public before the occurrence of a disaster or by the 30th of April in conjunction with NDMD
3. Arranging for the proper maintenance of emergency shelters through the relevant Government Departments in conjunction with NDMD
4. Maintaining an updated list of all approved emergency shelters with locations, ownership, capacity, facilities as well as contact persons, addresses and telephone numbers, where possible I conjunction with NDMD
5. Staffing and administration including security of emergency shelters in conjunction with NDMD
6. Training of shelter management personnel on a regular basis in conjunction with NDMD, Red Cross Society and Ministry of Health.
7. Conduct periodic maintenance and inspections to ensure the shelters are in good conditions and report on their conditions if they need to be fixed.
8. Arranging for the movement and care of the aged, disabled and incapacitated to emergency shelters.
9. Assist in arranging with the National Emergency Management Agency for the identification and management of emergency shelters in St. Kitts for accommodation of evacuees in the event of a volcanic emergency in Nevis.

15. Land Search and Rescue

Members:

1. Representative Fire and Rescue Services. Chairperson
2. Representative Police.
3. Representative, Defence Force/Coast Guard
4. Representative Nevis Air & Sea Port Authority

5. Administrator, Alexandra Hospital
6. Department of Fisheries.
7. Representative, Nevis Fisherman's Cooperative
8. Representative Captain of Ferry Services
9. Representative, Red Cross
10. Representative, Taxi Associations
11. Representative, Bus Association
12. Representative, Cadet Corps
13. Representative, Nevis Amateur Radio Club

Functions

1. To train personnel for search and rescues from collapsed structures.
2. To ensure the development of search and rescue and evacuation procedures for emergency situations.
3. To ensure guideline for SAR exist and are updated and tested regularly.
4. Develop a plan/procedure for land SAR during disasters.
5. Participate in mass casualty plans/ Incident Command System.
6. To train, orient and drill individuals in emergency procedures, and the development of rapid deployment procedures for personnel and vehicles.
7. To promote and evaluate drills in schools and commercial institutions, banks, etc.
8. To promote and evaluate drills in commercial buildings, restaurants, hotels, local shops serving food, etc.
9. The development and testing of evacuation procedures exercises in all government buildings, including schools, and the provision of similar exercises for private commercial buildings and industrial sites.
10. To acquire and store haz-mat equipment.
11. To ensure there are agreements with foreign teams (Puerto Rico, Trinidad and Tobago, etc.) to assist in SAR operations in Nevis if there is a disaster and they are needed.
12. Rescuing trapped or injured persons in post disaster operations.

16. Medical & Health Services Sub-Committee

Members

1. Medical Officer of Health – Chairperson
2. Health Disaster Coordinator
3. Director of Social Services
4. Representative Police Department
5. Senior Environmental Health Inspector
6. Supervisor of Public Health Nurses
7. Health Service Administrator
8. Government Pharmacist
9. Matron - Alexandra Hospital
10. Representative from Private Pharmacy
11. Manager, Nevis Solid Waste Corporation
12. Representative - Red Cross Society
13. The Medical University of America.
14. Representative, Emergency Medical Technicians

Functions

Medical Attention:

1. Establishing a system of staffing and equipping of First Aid Stations before the occurrence of a disaster.
2. Co-ordination of medical and First Aid Assistance with the relevant health related voluntary organisations. OK
3. Training of Health Service Workers and Emergency First Aid Personnel for operation at all Emergency Shelters and other First Aid Stations established in the districts
4. Proper identification of health service workers and First Aid Personnel and First Aid Stations for information of Field Personnel and the public.
5. Programme for first aid training of teachers and supply of first aid kits in schools.
6. Provide information about vulnerable groups in the communities (elderly, handicapped, children, etc.)
7. Train businesses in first aid and disaster preparedness.
8. Coordinating arrangements with the Transport Sub-Committee for the use of additional vehicles to augment existing ambulance service where necessary.
9. Requisitioning of medical supplies through the relevant departments as necessary (according to applicable legislation).
10. Identification and operation of Field Hospitals, if necessary.
11. Ensure counseling is provided to those affected by disasters.
12. Arranging with the National Emergency Management Agency for the provision of additional health service personnel, supplies and facilities to assist in disaster situations.

Environmental Health:

1. Provision of environmental health services at emergency shelters and the development of plans for quick deployment of health personnel to all pre-determined points. . (including disease surveillance during occupancy)
2. During a disaster, check shelters on a daily basis for environmental health issues.
3. Check garbage collection and disposal.
4. Ensure liquid waste disposal.
5. Ensure food safety.
6. Ensure debris and garbage are collected after a disaster in collaboration with PWD.
7. Ensure the final disposal site is maintained in a manner to accommodate additional solid wastes generated by the disaster
8. To have separation of white goods, green wastes, etc. from municipal solid waste.
9. Ensure roads are fixed to conduct solid waste management activities.
10. Identify designated areas for gathering and reducing the volume of the wastes generated by the disaster.
11. Coordinate volunteers for garbage collection activities.
12. To have adequate fuel (extra stock) to have access for the garbage trucks to conduct waste recollection.
13. Provision for efficient disposal of all refuse carcasses (dead animals EH).
14. Ensure adequate recollection and adequate disposal of dead animals, depending on the state: bury them on site or in the landfill.
15. In the case of human dead bodies, Police needs to be involved along with MOH (cause of death, identification, death certificate).
16. Environmental health would give recommendations for the management and final disposal of dead people.

17. Conduct vector control activities (destruction of breeding sites, or treat them with abate)
18. Conduct fogging activities in the case of adult mosquitoes.

17. <u>Utilities, Transport and Equipment Sub-Committee</u>

Members:

1. Permanent Secretary, Communications, Works, Public Utilities and Posts – Chairperson.
2. Director of Public Works - Deputy Chairman
3. Representative- Ministry of Health.
4. Representative - Police Department
5. Permanent Secretary - Ministry of Agriculture.
6. President – Nevis Taxi Association
7. President Queen City Taxi Association
8. President – Bus Association
9. President- Fishermen's Co-operative
10. Representative - Fire & Rescue Services
11. Representative - NASPA
12. President -Truck & Heavy Equipment (association not sure how active)
13. Director of Fisheries.
14. Nevis Water Department.
15. NEVLEC
16. LIME
17. DIGICEL
18. CHIPPIE
19. Caribbean Cable Communication

Functions.

1. Developing a resource list of all transport (including boats, outboard motors and aircraft) equipment (chain saws, etc.) that would be available for use in a disaster.
2. Ensuring that Sub Committee members provide their vehicles for transportation of persons and emergency supplies during emergencies and disasters.
3. Arranging for the release of privately owned vehicles, equipment, boats and aircraft.(According to applicable legislation)
4. Arranging for the release of vehicles to be used as emergency ambulances. (According to applicable legislation) Protocols to be established including operation by owners.
5. Developing a deployment plan to cope with transportation requirements at island level. Protocols to be established.
6. Keeping an updated list of operators for all types of transport.
7. Compensation as regards possible damage to vehicles (including boats, outboard motors and aircraft) utilized during emergencies.
8. Co-ordinating efforts with the Nevis Disaster Management Committee for the supply of additional marine and air transport for evacuation of population (to St Kitts, if necessary.) (Volcanic eruption, mass casualty event, etc.)
9. Ensure the roads are clear (debris, traffic, people, etc.) in order to conduct public utilities restoration.
10. Arranging for clearing of all (main roads a priority) for movement of emergency personnel and relief supplies as soon as possible after a disaster.
11. To assist in cleanup (resp. public health) and transport of emergency supplies
12. Conduct assessment of damage to the electricity distribution network and power station.

13. Restoration of public utilities: telecommunications, potable water supply and electricity.

18. Damage and Needs Assessment Sub-Committee.

Members:

1. Director, NDMD. Chairperson.
2. Chairpersons or designate of all Sub-committees.
3. Representative – Statistics and Economic Planning
4. Ministry of Finance
5. PWD
6. Public Utilities Companies
7. Police Department

Functions

1. To design a comprehensive Damage and Needs Assessment Plan during disasters.
2. Gather information in the EOC from all Sub-Committees about Damage and Needs during a disaster
3. Gather information from all District Emergency Committees during a Disaster.
4. Coordinate with the Emergency Supplies Sub-Committee to provide input about damage and needs in different locations.
5. Preliminary SITREP and Damage Report within 4 – 8 hours following the issuance of the 'All Clear' advisory
6. Expanded SITREP, updated Damage Report and Preliminary Needs Report within 24hrs and at the end of every 24hr period up to seven days after the 'All Clear.'
7. A detailed SITREP to include Sector information and Final DANA report 21 days after the 'All Clear.'
8. An After Action Report once the SRCC has been deactivated.
9. Provide all DANA information to the Department of Statistics and Economic Planning for it to conduct the Damage and Loss Assessment according to the ECLAC methodology.

19. Emergency Supplies Sub Committee

Members:

1. Permanent Secretary, Agriculture – Chairperson
2. Director of Agriculture
3. Water department.
4. Director - Gender and Social Affairs
5. Representative - Health Department
6. Representative - Police Department
7. Deputy Comptroller - Customs Department
8. Director of Trade
9. Representative – Statistics and Economic Planning.
10. General Manager - NASPA
11. Representative - Red Cross Society
12. President - Chamber of Commerce (red cross personnel)
13. President - Lion's Club/ (red cross personnel here)
14. President – Rotary Club (red cross personnel)
15. Representative – Adventist Disaster Relief Agency

16. Representative – Christian Council

Functions

1. Arranging for suitable buildings for the storage of food, clothing, building materials and other emergency supplies.
2. Arranging for safe areas for storage of non-perishable emergency supplies.
3. Establishing distribution centers for bulk distribution of emergency supplies.
4. Arranging for staff to package and distribute emergency supplies.
5. Arranging for transportation of emergency supplies to storage, from central warehouses to the districts villages and institutions.
6. Arranging for security of areas where emergency supplies are stored.
7. Determining number of persons to be fed in each district, institution and emergency shelter.
8. Determining the quantity and type of assistance required.
9. Sharing information and collaborate with all the entities about damage and needs assessment and distribution of supplies.
10. Based on the damage and needs assessment provide emergency supplies to areas affected by the disaster
11. Ensuring an efficient, timely and transparent distribution of emergency supplies in disasters
12. Ensure that security is provided in the process of receipt, storage and distribution of emergency supplies.
13. Keep records of emergency relief goods requested, received, stored and distributed to optimize distribution and to ensure transparency.

20. <u>Seismic/Tsunami/Volcanic Sub-Committee</u>

1. Director. Nevis Disaster Management Department. – Chairperson
2. Director, Public Works Department
3. Superintendent of Police
4. Medical Officer of Health
5. Medical Superintendent of Alexandra Hospital
6. Press and Government Information Officer
7. Representative - Red Cross Society
8. Representative – St. George's Improvement Committee
9. Representative - St John's Improvement Club

Functions

1. Coordinate with the Seismic Research Centre of UWI and other regional and international research institutes and Universities to find out about seismic, tsunami and volcanic risks for Nevis.
2. Develop hazard and risk maps for earthquake and volcanic eruption in Nevis.
3. Ensure building codes and land use are based on the earthquake and volcanic eruption risk in Nevis.
4. Develop warning system for the case of a volcanic eruption in Nevis.
5. Design warning systems and disseminate and test protocols for the case of a tsunami that could impact Nevis.
6. Develop a disaster management plans for earthquakes, tsunami and volcanic eruptions.
7. Advise Government and the population on the possibility of an eruption and issue of alert stages based on information from qualified Scientists to activate the response plan.

8. Develop appropriate public education programmes for dealing with earthquakes, tsunami and volcanic eruptions. .
9. Design an evacuation plan of Nevis in the case of a volcanic eruption.

21. <u>Environmental Pollution Sub-Committee.</u>

Members:

1. Director of Planning & Environment - Chairperson
2. Legal Adviser, Nevis
3. Superintendent of Police
4. Medical Officer of Health
5. Ministry of Agriculture (Pesticide Board)
6. Representative – Environmental Health Officer
7. Representative - Water Department
8. Representative - Nevis Historical and Conservation Society
9. Captain, Ferry Service
10. Manager – Nevis Solid Waste Management Authority
11. Representative – NASPA
12. Representative - Fire & Rescue Services
13. Representative of Bulk Petroleum Products
14. Delta Petroleum
15. Coast Guard.

Functions

1. Identify sources of environmental pollution: oil pollution, sedimentation of the marine environment from quarry activities, waste disposal, septic system, dust and noise pollution, pollution from industrial plants, etc.
2. Planning and, co-ordination of all action to deal with potential and actual environmental pollution incidents which may affect the community.
3. Design specific emergency plans and procedures.
4. Training of persons in prevention and control of and response to environmental pollution.
5. Developing appropriate measures of preparedness and systems for detecting and reporting environmental pollution incidents within the area.
6. Co-operation with local, regional, international and scientific organisations, involved in environmental pollution.
7. Identify resources for responding to environmental pollution incidents.
8. Stock recovery equipment (absorbent material), dispersant. Booms, etc.
9. Ensure there is equipment and materials for fire suppression as well as trained personnel.
10. Ensure sources of oil spills and other sources of environmental pollution have adequate equipment, materials and trained personnel to deal with specific events.
11. Ensure sources of oil spills and other types of environmental pollution have updated emergency plans and procedures to respond if there is the case.
12. Ensure there are specific emergency procedures in gas stations.
13. Ensure a coordinated response is given during environmental pollution events.
14. Ensure the environment is restored after environmental pollution episodes.

22. The Tourism Sector Emergency Sub-Committee

Members:

1. PS. Ministry of Tourism. Chairperson.
2. Nevis Tourism Authority.
3. Nevis Hotel and Tourism Association.
4. Police Force.
5. NASPA.
6. Immigration Department.
7. Ministry of Health.
8. Ground Handling Companies.

Functions.

1. Establish and maintain communication and coordinate activities with the NDMD, and other organisations that can contribute to disaster and emergency response;
2. Participate in the Nevis Disaster Managenment Committee;
3. Facilitate the provision of centralised coordination and control of disaster response within the tourism industry through the formation of a Tourism Emergency Operating Centre (TEOC);
4. Provide and supervise ongoing training of personnel in emergency procedures;
5. Establish a continuous emergency planning process in the Tourism Sector.
6. Keep abreast of any potential hazards that may pose a threat to the tourism industry via relevant agencies, media and the internet;
7. Facilitate the development of and periodically review the Tourism Sector Disaster Management plan for the tourism industry, which will mitigate the negative impacts on tourism facilities and services, and aid recovery;
8. Coordinate with the NDMD to ensure an early warning mechanism for hurricanes is established and trigger it within the Tourism Sector in the case of an impending storm.
9. Ensure the Tourism Sector activates the Tourism Sector EOC in the case of an emergency/disaster and consucts activities of damega assessment, emergency public information, re-location/evacuation of tourists as stated in their plan and always in coordination with the Nevis EOC.

CHAPTER 3 RESPONSIBILITIES OF GOVERNMENT AGENCIES

23. Responsibilities of Government Agencies.

Each Government agency is responsible for drawing up its own internal disaster management plan and emergency procedures. These plans and procedures must provide for security of the department as well as service to the public.

All revised and updated emergency plans and procedures must be submitted to the Secretary of the Nevis Disaster Management Committee not later than 30th April of each year.

It is important to note that in some cases where a Department or Statutory Body is assigned specific responsibilities in this Plan, ultimate responsibility rests with the Permanent Secretary of the Ministry concerned. The Permanent Secretary must ensure that all members of staff involved are familiar with the plan.

Some of the actions which will be necessary and which should be detailed in individual disaster plans are as follows:

24. Premier's Office.

1. Co-ordination of the Works of the Nevis Disaster Management Committee.
2. Co-ordination of disaster management plans and relief work.
3. Co-ordination of requests to the National Emergency Management Agency to overseas governments and other agencies.
4. Arrangements for relief aircraft and ships.
5. Issuing of notices for areas considered unsafe.
6. Informing the population through an island wide address about the impending impact of a hazard.
7. Declaration of Emergencies and Disasters.(According to applicable legislation)
8. Ensuring optimal communication with Federal Government

25. Ministry of Finance

1. Provide budgetary support for emergency preparedness, mitigation, response and recovery. .
2. Keep records of financial assistance received and disbursed.
3. Regulation of the entry of emergency supplies (customs)
4. Funding disaster management activities in general (operation of the DALA team, etc.)
5. Catastrophic fund access and other financial mechanisms to transfer risk (insurance, development of related policies etc.)

26. Department of Physical Planning.

1. Require Environmental Impact Assessments (EIAs) for development projects (gas stations, mechanic shops, etc. industrial activities, hotel and tourism, commercial,)
2. Ensure a Nevis building code is mandatory and enforced.
3. Planning and infrastructure guidelines
4. Regulate development on the coast
5. Inspectorate responds post event to assess damaged structures

6. Prevention and in the event of such happening, to have mitigation measures in place to eliminate or reduce the impact to the environment.

27. Department of Statistics and Economic Planning.

1. Collect, collate and publish historical damage statistics in collaboration with different agencies who are to collect statistics; i.e., damage to water supply system, how much water how it affected supply need to get it from water department
2. Assist in development of mitigation projects
3. Process disaster data and include in historical damage statistical
4. Organise surveys before and after disasters.
5. Spearhead the damage and loss assessment (DaLA) after a disaster (ECLAC and OECS/ESDU)
6. Estimate amounts of financial and other relief and rehabilitation requirements.
7. Assist with co-ordination of requests for projects coming out from the disaster.

28. Ministry of Agriculture, Housing, Labour, Tourism and Development.

1. Identification of food centres throughout the Island. Marketing division
2. Maintenance of adequate food centres throughout the island.
3. Information to the public on food distribution centres.
4. Assignment of personnel to work in these centres in the event of an emergency.
5. Arrange adequate transport service for the distribution of food to all emergency distribution depots in coordination with emergency sub-committees.
6. Assist in the designing of rationing systems.

29. Police

1. Bring the Police Plan to the attention of all ranks quarterly
2. Protection of life and property, and prevention of vandalism.
3. Help disseminate disaster management information
4. Ensure there are generators for all police station
5. Participate in the operation of warning systems.
6. Assist in informing the public of impending disaster
7. Initiate public warning systems (cars loudspeaker, and media, radio stations etc.) in the case of an impending impact of a hazard.
8. All ranks return to their station within a specific time when there is an early warning of a disasters
9. Send a Police representative to the EOC
10. Security of essential services and vulnerable points.
11. Assistance in rescue and evacuation (from Fire and Rescue).
12. Concentrate in communities and town area to avoid looting
13. Divisional commander to liaise with Director NDMD
14. District commander to liaise with shelter managers.
15. Notify of all personnel of disaster by use of media and ham radio operators
16. Traffic control to and from emergency areas and hospitals.
17. Crowd control.
18. Deploy patrol assessment teams
19. Officers in districts to make assessment of damage during and after disaster and report to district commander and then to EOC.

20. Performing patrol duties, foot and mobile, with a view to enforce a possible curfew and prevent looting.

30. Fire and Rescue Service

1. Establish and train a Search and Rescue Team: Fire Service, Police, Health and volunteers.
2. Plan and coordinate all fire-fighting operations.
3. Coordinate search and rescue operations
4. Design evacuation procedures, including evacuation of buildings.
5. Pumping of flood waters. Coordinate with private sector for additional pumps.
6. Water dept would be called upon too to bring more water to the area for fire control.

31. Department of Education.

1. Staffing of emergency shelters (in the initial period after a disaster, teachers would be utilized as support staff until they are back into schools based on the areas they reside). This should be done in co-operation with Emergency Sub-Committees as required.
2. Ensures teachers are trained in shelter management and the disaster management process. Minimise loosing time on task (get back into classes)
3. Liaise with Ministry of Health on Sanitary Services for shelters.
4. Assist in the training of Shelter Staff
5. Assisting District Emergency Committees in ensuring the delivery of First Aid boxes to emergency shelters in collaboration with Ministry of Health. ?
6. Collaborating with Emergency Supplies Sub-Committee in distribution of supplies and other materials.
7. Collaborating in giving education information to students. Train teachers in disaster management
8. Conduct drills in schools so children are more sensitized as to what can happen during disasters.
9. Educational components. Ensure teachers are aware what disaster preparedness means to teach children and parents.
10. Develop/Implement grade level/age-appropriate activities to ensure children are exposed to comprehensive disaster management.

32. Health Department.

1. Conduct all health disaster management activities within the Health Sector.
2. Ensuring that hospitals and health centres make and practice disaster plans.
3. Conduct education activities of the public in matters concerning public health in coordination with the Public Education Sub Committee.
4. Preparation of a manual for First Aid Stations and personnel.
5. Establishing procedures for collaboration with the Red Cross Society.
6. Maintenance of staff of First Aid Stations in collaboration with the District Emergency Committees.
7. Be assisted by the District Emergency Committees with the staffing of the First Aid Stations and training of personnel.
8. Provision of first aid boxes and other medical supplies to First Aid Stations.
9. Participating in disaster related simulation exercises in co-operation with other disaster management agencies.
10. Managing EMT personnel and ambulance service (from Hospital)
11. Assess the damage and needs of the health sector after disasters and report to the EOC.
12. Caring for injured, old persons and children.

13. Provide medical attention to all injured after the disaster and ensure there is counseling for the affected population.
14. Arrangements for emergency mass immunization, if required.
15. Arranging for the prevention and/or control of any outbreak of disease resulting from a disaster. (Environmental Health) Information to the general public on what to do and not to do.
16. Providing sanitary services for shelters, where necessary. (EH)
17. Arranging for sanitary inspection of relief food supplies. (EH)
18. Conduct vector control activities (EH).
19. General sanitation after disasters (EH)
20. Assist Police in recording, tagging, identifying and burying the dead. (Police/MOE)
21. Monitoring, assorting and distributing relief medical supplies in coordination with the Emergency Supplies Sub Committee and the EOC.
22. Ensure a SUMA team is trained and with adequate equipment to assist in emergency relief receipt, storage and distribution.
23. Ensure, in coordination with water department, the adequate quality of potable water for the general public in disasters.

33. Ministry of Communications, Works, Public Utilities and Posts.

1. Clear roads after disasters. (PWD)
2. Assistance in rescue work, in collaboration with Fire Officers. PWD/Water Department.
3. Provision of emergency transport services. All agencies.
4. Maintenance and repair of telecommunication system. (Telecomm)
5. Inspection of hurricane shelters. PWD.
6. Maintenance of all emergency shelters. PWD.
7. Supply generators and motor car batteries as directed by EOC. PWD/NDMD
8. Clearing and cleaning of drains. PWD.
9. Secure buildings before storms PWD.
10. Assist in evacuation operations, as required. All agencies
11. Evaluation of damage of government buildings after emergencies and disaster. PWD.
12. Declare buildings safe or unsafe. Planning /NDMD
13. Demolition of unsafe buildings. PWD.
14. Inspection of bridges and culverts and roads. PWD.
15. Undertake required and necessary road repairs. PWD.
16. Coordination of telecommunication systems (Telecomm.)
17. Testing the quality of water supplies (Water Department and Environmental Health).
18. Coordinate with heavy companies and other organizations for the use of heavy equipment to clear roads. Particularly access roads to landfill.

34. Legal Department.

1. Revise and update Emergency Legislation.
2. Review and development of regulation for shelter administration in collaboration with relevant ministries.

35. Social Services, Youth, Sports, Social Development and Culture.

1. Have a database of critical persons (doctors, nurses, school teachers, etc.) in the Districts.
2. Assist in the development of a register of all community organisations as a resource manual for manpower support.
3. Assist with the transfer and relocation of evacuees.

4. Providing information to evacuees on alternative shelters.
5. Assist with registration of evacuees at shelters
6. Supplying of additional manpower if required by the senior shelter manager.
7. Assist with information on possible numbers of evacuees and their Districts of organisation.
8. Assist with unsupervised children and senior citizens.
9. Requisitioning relief food and other essential supplies for shelter occupants

36. Ministry of Tourism.

1. Ensure accommodation sector inform tourists about hazards (hurricanes, volcanic activity, earthquakes) and disaster preparedness.
2. Assess hazard vulnerability of the Tourism Sector to different hazards.
3. Encourage stakeholders to mitigate long term effects of hazards in their facilities.
4. To have a Tourism Sector Plan and emergency response procedures periodically updated and tested
5. Ensure accommodation sector has specific emergency plans and procedures for the case of emergencies and disasters.
6. Conduct and promote regular simulation exercises for the Tourism Sector and its members to test plans and to enhance the Tourism Sector level of preparedness.
7. Respond through the Tourism Sector Emergency operations Centre in the case of an emergency /disaster
8. Assess the damage and needs of the Tourism Sector in the case of a disaster and report to the EOC.
9. Prepare public information about damage and status of the Tourism Sector after a disaster to be disseminated nationally and internationally.

37. Statutory Bodies.

38. Nevis Solid Waste Management Authority (NSWMA).

1. To ensure garbage and disaster debris are collected and disposed of after disasters.
2. To provide efficient collection and disposal system for refuse and carcasses.
3. To ensure additional fuel is stored for trucks.
4. To ensure the roads to the landfill are clear.
5. To collaborate with the Ministry of Health and any other relevant ministries for ensuring garbage collection and final disposal.
6. Make arrangements for the use of additional vehicles for transportation.

39. Nevis Air & Sea Port Authority (NASPA)

1. Receive weather forecast from Antigua and disseminate it to the media and specific agencies such as NDMD so that all the population and organisations in Nevis would know about the approach and impact of a hurricane.
2. Provide up to date weather report and bulletins.
3. Assist with rescue and evacuation efforts.

40. Nevis Electricity Company (NEVLEC)

1. Design and update a disaster plan to restore electricity after disasters

2. Maintain adequate supply during disaster
3. Maintain and repair electrical damage
4. Notify the public of status of electricity.
5. Inform the EOC about the situation, damage, needs and action taken.
6. Inform the CARILEC about the situation, damage, needs and action taken.
7. Maintain communication with telecommunication companies, Water Department and Cable TV regarding restoration of electricity.

41. <u>Nevis Housing and Land Development Corporation (NHLD).</u>

1. Identify buildings for temporary shelters.
2. Construction of temporary shelters.
3. Assist with transport and search and rescue.
4. Assist with the repair to damaged buildings.

CHAPTER 4 ROLE OF NON-GOVERNMENTAL ORGANISATIONS (NGO's) AND SERVICE CLUBS

42. Chamber of Commerce

1. Identify and provide warehousing.
2. Ensure -availability of essential emergency supplies. (Building supplies, food, water, equipment, transportation, tarpaulins, medical supplies).
3. Participate in disaster management public awareness activities (sponsoring of public awareness slots)
4. Spearheading training, simulation exercises, drills, disaster plans for businesses
5. Promote certification of business places regarding disaster management.
6. Ensure members design business continuity plans.
7. Insurance (physical property, equipment and stock).
8. Sensitisation of members regarding insurance and other risk management tools.
9. Participation in the hurricane warning process alerting Chamber members once notified by NDMD.
10. Financial and other assistance (provision of lumber for repairs, etc.) in the case of disasters.

43. Red Cross Society.

1. Assist with first aid training.
2. Provide relief supplies.
3. Assist with distribution of relief supplies.
4. Assist with first aid at medical centres and emergency shelters if requested.
5. Assist in search and rescue.
6. Training in disaster preparedness
7. Train and mobilize local teams that could be called upon to assist in disasters.
8. Share and receive information with other relief supply organizations about damage and needs and distribution of emergency supplies.

44. Adventist Disaster Relief Agency (ADRA).

1. Have a warehouse to provide relief supplies in the case of a disaster.
2. Assist with distribution of relief supplies
3. Work with government to optimize distribution of relief items and provision of assistance
4. Provide volunteers from congregations and communities to assist with relief items distribution
5. Counseling to affected population.
6. Helping affected persons rebuild their lives.
7. Financial support to affected population.

45. Christian Council.

1. Assist with management of shelter.
2. Assist with distribution of relief supplies.
3. Provide relief supplies.
4. Assist with rehabilitation.
5. Assist in public awareness programmes.

46. Amateur Radio Club.

1. Assist with telecommunications at essential points in keeping with directions of the Telecommunications sub-committee.
2. Assist the EOC with telecommunications and personnel.

47. C B Radio Club.

1. Assist with telecommunications.
2. Assist the EOC operations with telecommunications and personnel.

48. Lime, Digicel, Chippie.

1. Provide emergency telecommunications at essential points.
2. Restore telephone services as soon as possible

49. Youth Council.

1. Assist with distribution of education material.
2. Performing messenger service.
3. Assist with evacuation of victims and aged persons.
4. Assist in clearing debris.

50. Jaycees, Lions, Rotarians.

1. Assist public awareness programmes.
2. Assist with evacuation of disaster victims and aged persons.
3. Assist in providing relief supplies
4. Assist with rehabilitation.

51. Boy Scouts, Girls Guides, Cadets, Brigades, 4-H Clubs.

1. Assist in distribution of educational material.
2. Assist with evacuation of disaster victims
3. Provide messenger service.
4. Assist at emergency shelters and feeding centres.
5. Assist with sorting and parceling of clothing.
6. Assist in record keeping.
7. Assist in clearing debris.

52. NGOs.

a. Hope Nevis
b. St. John Improvement Club
c. Returning National Society Nevis
d. St. Kitts- Nevis Islamic Organisation
e. Guyanese Association
f. Nevis Historical and Conservation Society.

1. Collaborate and reach specific target groups for public awareness information.
2. Assist in shelter management, first aid and emergency supplies distribution.

CHAPTER 5 DISTRICT EMERGENCY COMMITTEES

53. District Emergency Committees

The responsibility for setting up, servicing and monitoring of the District Emergency Committees rests with the NDMD.

District Emergency Committees provide the essential link between the Nevis Disaster Management Committee and the communities which they represent.

The main objective of the District Emergency Committee is to prepare the community for any disaster and to co-ordinate the activities of the community and their resources for assistance prior to, during and after a disaster situation.

Responsibilities

The responsibilities of the District Emergency Committee include:

1. Selection and appointment of members
2. Development of an emergency plan for each district.
3. Election and training of personnel for field operations.
4. Participation in the overall planning of disaster preparedness operations in the district.
5. Co-ordination of operational plans of all Emergency services at district level.
6. Development of job functions for members of the district organisation.
7. Supplying periodic reports to the NDMD on all disaster preparedness activities.
8. Gather information about damage and needs assessment in the case of a disaster and submit it to the NDMD/EOC.
9. Provide emergency relief and assist with distribution of relief items.

The District Committees should establish formal lines of communication with all government departments and NGO's in the District.

District Committees will establish and maintain links with the NDMD, the EOC and Sub Committees in the case of an emergency or a disaster as necessary.

Structure

The District Emergency Committees should have a small management committee of persons who are willing to accept responsibility. Each Committee should include a Chairman and a Deputy Chairman from its membership. The Chairman will serve as liaison officer with the Disaster Management Committee. It will also be necessary to have supporting key personnel responsible for supervision of:

a. Shelters
b. Feeding
c. Clothing
d. First-aid
e. Damage and needs assessment
f. Communications

Membership of the District Emergency Committee should include the Senior Police Officer in the District, the District Medical Officer, District Nurse, Representative of Voluntary Service Organisations, Service Clubs, Farmers, Groups, etc.

All committee members should make themselves familiar with all aspects of the committee's activities in the operational plan.

For purposes of this plan the following Emergency Districts have been created:

DISTRICT	HEADQUARTERS
St George Area	Croney's House, Gingerland

1. Stonyhill, Rawlins, Zetlands, Old Manor Estate, Taylor's Pasture, Maynard's Ground
2. Market Shop, Crook's Ground, Rices, Buck's Hill Sherriff's, Holmes Hill (Hanley's Road)
3. Hull Ground, Fenton Hill, Golden Rock, Webbe's Ground, Hickman's, Harris', Zion Village, New River

St James' Area — Combermere School

1. Eden Brown, Butler's Village, Mannings, White Hall, Brick Kiln, Maddens, Hick's
2. Fountain to Mount Lily
3. Barnaby, Liburd Hill, Camps, Combermere
4. Scarborough, Rawlins, Shaw's Road Newcastle

St Thomas' Area — St Thomas' School, Lowlands

1. Westbury, Cotton Ground, Barnes Ghaut, Jessup, Vaughan's, Stuarts

Charlestown
Area

1. From Pinney's Road at New Cut along Old Hospital Road, including Craddock Road, Low Street, Crosses Alley and turning left in Chapel Street then right into Featherbed Alley, continuing east into Ramsbury up to the Cable TV antennas, turning north and following an imaginary straight line back to New Cut.

2. From Chapel Street traveling southwards to Bath Stream, following the island main road to the intersection of Pump Road and the Island Main road of Bath Cemetery; then turning north wards towards Government Road, (including both sides of Pump Road) to the intersection of Government Road and the Pump Road by the Water tank, then turning Northwards towards Hamilton Estate, (including both sides of upper Government Road) to the ruins of Hamilton Estate then along an imaginary straight line back to the Cable Television antennas.

3 All that area known as upper and lower Bath Village including Bath Plain.

St John's St John's School, Brown Pasture

Area

1. Upper Stoney Grove, Farm's Estate, Prospect, Brazier's Estate, Hamilton Estate, Fig Tree, Church Ground, Victoria Road
2. Brown Hill
3. Montpelier Estate, Bush Hill, Cox, Beaumont, Clay Ghaut, Chicken Stone
4. Pond Hill, Beach Road, Hermitage, Cole Hill, Brown Pasture, Burden Pasture, Morning Star.

CHAPTER 6 THE NEVIS EMERGENCY OPERATIONS CENTRE (NEOC)
(For detailed information and SOPs see the Nevis EOC Manual)

54. The Nevis Emergency Operations Centre (NEOC).

The Nevis Emergency Operations Centre will be located at Lewellyn Newton Disaster Management facility located at Long Point. The Emergency Operations Centre will co-ordinate all activities immediately before, during and after an emergency or a disaster.

The EOC will be activated by the Premier or by any person empowered to act on behalf of the Premier. The centre will be manned in three 8 hour shifts by three teams working in rotation.

The NEOC is divided into the following functional areas:

1. Executive Policy Group
2. Operations Group
3. Communications (NETC)
4. Public Information and Education Group

Executive Policy Group.

The Executive Policy Group exercises overall direction and control of disaster operations. This group makes decisions, which are beyond the authority of the NEOC Director, and comprises:

1. The Premier as Chairperson or nominee.
2. Deputy Chairperson: Permanent Secretary Office of the Premier.
3. The Director, Nevis Disaster Management Department.
4. Director of the Government Information Service (GIS).
5. Head of Police in Nevis.
6. Persons designated by the Premier, as deemed necessary, to assist in the policy and decision making process for the appropriate disaster event.

Operations Group.

The Operations Group coordinates the emergency/disaster response and relief efforts and activities as directed by the NEOC through the Director of Operations of the NEOC. The Operations Group is responsible for directing emergency response operations. The group comprises:

1. Director of Operations.
2. Director of Communications.
3. Housing and Shelter Management Sub-Committee Representative
4. Damage and Needs Assessment Sub-Committee Representative
5. Health and Welfare Sub-Committee Representative
6. Utilities, Transport and Equipment Sub-Committee Representative
7. Land Search and Rescue Representative
8. Police Representative
9. Supply Management Sub-Committee Representative
10. Red Cross Representative.
11. Representative of Ministry of Tourism.
12. Others deemed by the NDMC or the NEOC if necessary.

Once the decision to activate the EOC is made, all the agencies that have to be there shall designate a representative and an alternate and inform the NDMD Director.

All EOC members shall go immediately to the NEOC once it is activated.

The EOC will be equipped with the necessary maps, displays, status and situation boards, plans and procedures brought by EOC members and will be supported by NDMD Staff and personnel acting as radio operators, message handlers, journal clerks and runners.

Telecommunications.

One of the critical reasons for creating the NEOC is the consolidation of the communications network. Without proper communications, the effectiveness of the NEOC would be severely limited. One of the primary concerns of the NEOC is the efficient assimilation and dissemination of information from disaster sites to the resource managers and the public at large.

Director of Communications.

The Director of Communications is responsible for the activation, operations and deactivation of the Nevis Emergency Telecommunications Centre (NETC). The Director of Communications is also a member of the NEOC and is responsible for receiving all messages and handing them to the Director of Operations for decision making.

The Nevis Emergency Telecommunications Centre (NETC)

The Nevis Emergency Telecommunications Centre is located in the NEOC and it is equipped with telecommunications equipment and has personnel to operate that equipment. The NETC is maintained and its equipment is tested regularly by the Communications Officer of the NDMD in coordination with, and with support from Police and radio operators.

During emergencies and disasters, the NETC is activated, immediately after the alert phase is given, by the Director of Communications. The NETC will be maintained and operated under the direction of the designated Director of Communications. In addition to the radio equipment in the NETC, other agencies such as the Police, the CB clubs and the Amateur Radio Club may position their own radios and operators in the NETC. The NETC will be deactivated by the Director of Communications.

The NETC will have volunteers from different organisations to participate in the operations of the NETC as message handlers, radio operators, journal clerks and runners. A list should be prepared by the NDMD and it should be revised and updated regularly. Volunteers will be briefed/trained in their duties before being accepted in the NETC.

Emergency Public Information and Education.

It is important that the public is kept informed of the emergency/disaster in a manner that is both timely and factual through the Government Information Service. The media both print and electronic, will be the most important pipeline to the public at large, in disseminating news. It is therefore imperative that they are kept informed of facts on an on-going basis with briefings and bulletins. The GIS representative in consultation with the Director of the EOC will determine and regulate the rules of engagement with the media for the Public Education/Information and any other officer authorized to communicate with the media.

A representative of GIS in the NEOC will be the Public Information and Education Officer at the NEOC (additionally to the Director of GIS considered in the Executive Policy Group). An alternate will be appointed too. Both PIEO and alternate will be appointed in the NDMC emergency meeting. The PIEO will gather information from representatives of the various Sub-Committees operating in the NEOC and prepare it for dissemination to the public at large.

All information released to the public by the PIEO must be approved first by the Director of Operations of the NEOC.

For specific Emergency Procedures and NEOC layout and functions see the Nevis EOC Manual.

CHAPTER 7 EMERGENCY ALERT SYSTEM

55. Emergency Alert System.

The first report of a major emergency will be given to NDMD either by:

1. Superintendent of Police. Coast Guard
2. General Manager Nevis Air And Seaport Authority.
3. Medical Officer of Health.
4. Divisional Fire Officer.
5. District Emergency Committees

Reports of hurricane, major flooding, major accidents, fire, terrorism will originate from the Director NDMD or Police/Fire Services. Reports of sea accidents and oil spills (at sea) will come from either the General Manager N.A.S.P.A. or the Met Office at VWA International Airport. Air accidents will be reported by the General Manager N.A.S.P.A. and disease epidemics will be reported by the Medical Officer of Health.

All reports of major emergencies will be directed to the Chairman of the Disaster Management Committee, according to the following procedure:

Hurricane and Volcanic Eruption

Chain of command notification tree

National Disaster Coordinator St. Kitts	-	Inform Prime Minister
	-	Chief Secretary
	-	Commissioner of Police
Chief Secretary, St Kitts	-	Inform Chairman, Disaster Management. Committee, Nevis
	-	Premier's Secretary, Nevis
Premier's Secretary	-	Inform Disaster Coordinator, Nevis
	-	All Permanent Secretaries
NASPA. Met Office (hurricane)	-	Inform Director NDMD.
Director NDMD	-	Informs all members of the Nevis Disaster Management Committee.
Commissioner of Police	-	Inform Superintendent of Police, Nevis
	-	Premier's Secretary, Nevis

Permanent Secretaries	-	Inform all Heads of Departments and Statutory Bodies
Superintendent of Police	-	Inform Premier, Nevis
	-	Premier's Secretary
<u>Major Accident/Oil Spill</u>		
Superintendent of Police Harbour Master Airport Manager	-	Inform Premier's Secretary
Premier's Secretary	-	Inform Premier
	-	All Permanent Secretaries
	-	Director NDMD
Disaster Coordinator Health	-	Inform Hospital Administrator
<u>Air and Sea Accidents</u>		
General Manager	-	Nevis Air and Sea Ports Authority
	-	Nevis Disaster Management Department
Director	-	NDMD Director
	-	Premier's Secretary
	-	Divisional Commander Nevis Division of Police Force
<u>Threats and Terrorism</u>		
Divisional Commander Nevis Division of Police Force	-	Nevis Disaster Management Office
	-	Premier's Secretary

56. <u>Telecommunications.</u>

The Emergency Telecommunications Centre is located in the EOC in the Llewelyn Newton Building in Long Point and it will be communicated to key organisations involved in emergency response (Police, Fire Service, Hospital, etc.)

Points will be established in the Telecommunications Centre for the installation of equipment of Amateur Radio, Citizens Band and other radio operators likely to be used during a disaster.

In the event of a disaster or major emergency the Director of the NDMD will contact the Amateur Radio and other operators with regard to assistance in telecommunications for both islands.

In the event of an emergency and when so requested, the Amateur Radio Citizens Band Operators will make available to the EOC equipment and operators as may be necessary for providing

communications between the Emergency Telecommunications Centre and the respective areas to which they may be assigned.

The Clubs will assign equipment and operators to the various areas identified by the Director of the NDMD.

The Amateur Radio, Lime, Digicel, Chippie and Citizens Band Clubs draw up their own internal disaster plans for submission to the Director NDMD by the 30th April.

Lime, Digicel and Chippie will provide emergency links between the Emergency Operations Centre, Police Headquarters and other areas as required, and the maintenance of all external communications systems at regional and international level.

The Emergency Telecommunications Centre will have back-up generators to ensure it can work 24 hours a day during emergencies and disasters.

(For more details about the Nevis Emergency Telecommunications Centre (NETC) see the Nevis EOC Manual).

CHAPTER 9 EMERGENCY SHELTERS

57. Emergency Shelters.

The Permanent Secretary, Ministry of Education, as Chief Shelter Warden, will maintain a list of buildings which have been identified as shelters for use in an emergency.

The list of emergency shelters will be revised each year in the month of March; the list of shelters will be published in the official Gazette and in the local newspaper and other media by the 30th April.

In conjunction with NDMD revise the list of shelter managers and staff every year.

Each District Emergency Committee will arrange for the wide publicity of shelters in its area through churches, schools, voluntary organisations and community groups and the Village Emergency Committees and other ways.

The Chief Education Officer in collaboration with the Chief Community Development Officer and the District Emergency Committees will ensure that the District Emergency Committees will have the shelter open and ready to receive evacuees when necessary.

The Chief Education Officer in conjunction with NDMD will ensure the appointment and training of suitably qualified staff to manage emergency shelters.

The Chief Education Officer will collaborate with the District Committees and the Chief Community Development Officer and the Public Works Department and other agencies to ensure the proper maintenance of emergency shelters.

Where tents are used as emergency shelters they should have security provided by the Police Department.

58. Revision and Updating of the Hurricane Plan

58.1 The Planning Process.

Planning is a process not a product.

A written plan that is not updated does not reflect the state of preparedness of an organisation or a country against specific hazards. Particularly if it is old, if it has not been updated for years and/or if it does not include real information about what is likely to happen and resources to respond against an emergency or a disastrous situation.

Resources change in time: personnel change, organisations change, equipment and vehicles change too; consequently, plans must change too: if plans are not updated, they become useless, for activities and resources considered in them will not be real. Resources do not change every year or every two years. Sometimes they change more often or regularly.

Moreover, the possibilities of interaction and changes between the hazard characteristics, the vulnerable elements that can be affected by the hazards and the response capability of the disaster management organisations are almost infinite. This is why we should permanently try to identify problems and changes in our resources to improve our future response in the case of an event.

So emergency planning:

1. Must be a continuous activity. This will allow to identify and to solve problems before any hazard strikes.

2. Must involve those in charge of giving the emergency response. All personnel and organisations that have to participate in the response in the case of a threat and/or impact of a hazard must be involved in the planning process. They are who will respond and they are who know what resources they have to do it.

3. Must reflect reality. An emergency plan must be based on the real characteristics of:
    a. Hazards
    b. Vulnerable elements
    c. Existing resources to respond
    d. Expected damage
    e. The real and adequate response and recovery activities that have to be done in the case of the hazard threat or impact according to the possible damage that can occur.

So, the planning process must be done considering:

1. A specific revision period. The period in which the written plan or its activities have to be revised and updated has to be defined: monthly, bimonthly, quarterly, yearly, or any other as needed.

2. The participation of all the organisations involved in the response. Plans and procedures must be revised by ALL the organisations involved. If this does not happen, or if this happens partially, we will have a useless plan or an incomplete plan that could be useless as well. This

includes the planning and response organisations from all sectors and at all levels (government, private, social and national, regional and, if needed, international).

3. The resources that can be used in the response. Only those resources that exist and/or that are in good working conditions should be considered in the written plan. Lists of personnel that do not exist and/or list of equipment and vehicles that do not work should not be considered in the written plan. They will not be working or being used in a real response.

4. The time and the sequence in which the activities have to be done. The plan and procedures must establish what activities have to be done and when; those that go first and those that have to be implemented after the previous ones. In other words, emergency activities (plans and procedures) are not just *a list* of activities but the description of *a sequence* of activities (through time).

5. The definition of clear parameters whose occurrence involve (determine) the consequence of specific response/recovery activities. Quantitative parameters should be developed and clearly established in the plans in order to clearly determine when and under what conditions response/recovery actions have to be taken. Quantitative parameters and indicators have to be designed and developed to trigger the plan, initiate response, to initiate evacuation, to activate and deactivate shelters, to activate and deactivate EOCs, to start a mass casualty event response, to give the all clear message, etc. These are actions based on facts, numbers and other conditions and not based on subjectivity or political decisions.

6. The need of testing and evaluating the plans. Emergency planning must be tested through simulation exercises. The evaluation of simulation exercises and the evaluation of real events should take to an immediate revision of the plan and the information included in it.

58.2. Organisations Responsible for Revising the Plan

The general responsibility fall on NDMD as the Co-ordinating organisation of the whole disaster management process: However, all the organisations considered in this plan are responsible for the yearly revision and updating of their procedures they are responsible for and for the revision and updating of the whole plan itself.

58.3. Revision of the Plan.

It is important to define what is to be understood by revising a plan. So here are the elements that have to be considered in any plan's revision:

A.- General information that justifies the plan:

1. Characteristics of the hazard the plan is for (origin, cause, predictability, magnitude, controllability, scope of impact, duration, destructive potential, etc.).
2. Characteristics of the vulnerable elements (number, type and location of people at risk, facilities, equipment, information, crops, livestock, infrastructure and services).
3. Disaster scenario: What is likely to happen if the hazard strikes a specific vulnerable area (Number, type and location of: casualties, evacuees, homeless, houses, infrastructure and services affected, information lost, environmental impact, etc)
4. Functions needed (according to the type of hazard and vulnerable elements): warning, co-ordination, communications, evacuation, shelter activation, search and rescue, medical attention, security, rehabilitation of services, etc.)

5. Identification of organisations and assignment of responsibilities: MOH for medical attention, environmental health; Police for security, evacuation; Met office for monitoring and warning, *etc.*
6. Writing down the activities to be implemented: writing the plan and procedures: warning, evacuation, search and rescue, etc.) See point B below.

B.- The written plan and its contents:

1. General information about hazards and response needed (point A above).
2. General information about aim, purpose, objectives, legal framework and organisations involved in the plan.
3. Conditions (quantitative) that trigger the plan (if applicable [predictable hazards])
4. Conditions that activate the response (non-predictable hazards).
5. Written description of activities (procedures: main responsibilities, activities through time per responsible per function).
6. List of resources to be used in an emergency (see point D below).
7. Other information (Maps, charts, etc.)
8. Training programme.
9. Simulation exercise programme.
10. Procedure for revision and updating the plan.

C.- The planning process:

1. Date of revision and number of version.
2. Organisations involved in the response/recovery.
3. Organisation(s) responsible for revising and updating the plan.
4. Organisation(s) that revised and updated the plan
5. Involvement in the writing of the plan and procedures of all the organisations involved in the response/recovery.
6. Evaluation of the training programme
7. Results and evaluation of simulation exercises
8. Evaluation of real events

D.- Resources.

1. Checking the existence (visual/physical/tangible/operational), availability, veracity, level of preparedness, training, and/or working conditions of:
    a. Personnel and their training (knowledge of procedures, use of equipment, etc)
    b. List of personnel.
    c. Directories.
    d. Inventories
        i. Equipment (communications, heavy equipment, others)
        ii. Transportation (vehicles, boats, planes, etc)
        iii. Medicines and medical equipment
    e. Maps.
    f. Information (any item quantified or mentioned in the plan: population, # of houses, location and type of shelters, etc.)

As it can be seen, revising an emergency response plan does not only involve reading the document. It has to be done according to a specific model and by a specific approach in order to avoid subjectivity of the plan reviewer(s).

58.4. Responsibilities of the Planning Organisations.

In general all the organisations involved in this plan should:

1.- Revise the plan and its procedures (See above).

2.- Meet at least yearly (Committees and Organisations responsible for all the functions)

3.- Revise and update the plan and its procedures at least once a year and every time after a simulation exercise and after real events.

4.- Update directories, inventories and other information every year before the hurricane season.

59.- Dissemination of the Plan

The plan and its procedures have to be disseminated, they are not a secret.

The plan has to be distributed to:

1.- All the organisations involved in the planning process and in the response.
Governmental
Private
Social
2.- The Media
3.- Regional and international disaster management organisations
4.- Donors
5.- CDEMA Participating States
6.- Academic Institutions

Besides the technical version of the plan other versions can be prepared:

1.- Version for the Media and for Public Information
2.- Internet Version

The dissemination of the plan must be done by NDMD. All copies of the plan should be numbered if considered necessary. Record of all the copies and their possessors must be kept by NDMD.

60.- Training

It has to be ensured that every training course delivered pertaining to this plan considers the following aspects:

1.- The need for the training course. (the training course trains personnel considered in this plan and in functions.
2.- The adequate objectives that justify the training course delivery.
3.- The adequate participants (target audience): personnel/organisations that have to be trained in a specific activity.
4.- The adequate number of participants: all personnel involved in a specific disaster management activity must be trained.
5.- The adequate trainers: trainers with knowledge on the subject and with training skills.

6.- The adequate contents of the training course: participants must be trained to conduct efficiently the disaster management activity they are responsible for; the course must be adapted to a specific hazard and to the specific country's characteristics (geography, topography, population, vulnerability, economic and even religious aspects). Training courses have to be evaluated, improved and updated.
7.- The adequate duration of the training course, depending on the disaster management activity and the course contents. Short and concise training courses are preferred.
8.- The adequate number of courses: depending on the number of personnel that has to be trained.
9.- The adequate frequency/timing of the training courses: this is the right number of times in a specific period that the training course has to be delivered and the right specific time of year when it has to be delivered.
10.- The adequate outcome: this is, what do we want to have after the training course: i.e., not just trained personnel, but a revised plan, the establish an organisation/team an EOC, the writing of a specific procedure, etc.
11.- The adequate evaluation and follow-up: training courses must be evaluated and improve permanently. A close follow-up of the outcome must be given: changes in personnel/organisations, revision of procedures, change in number of shelters, etc.

The organisation responsible for disaster management training is the NDMD as the coordinating organisation of the whole disaster management process; however, each organisation responsible for each function is responsible to have their personnel adequately trained to efficiently execute their own tasks as stated in the Plan and its Procedures.

61.- Simulation Exercises

Simulation exercises are exercises by which the organisations, institutions, personnel and equipment involved in a specific emergency response plan and/or emergency procedures are tested under the imaginary impact of a specific hazard.

Simulation exercises are one of the last steps of the disaster management process; *i.e.,* they can only be executed after having done all the previous disaster management activities: risk assessment, scenario design, planning, training, etc.

Simulation exercises consist of:

1. An emergency plan and procedures for a specific hazard that are to be tested.
2. Personnel of the institutions involved in response whose performance is going to be tested.
3. Equipment and materials whose availability and working conditions are to be tested
4. A particular disaster scenario. This is, what is supposedly happening.
5. Logistics. All equipment and personnel needed for the adequate execution of the exercise must be in the right place at the right time in the right order for the right purposes.
6. A theatre of operations. The place where the exercise is going to be executed (the place that is supposedly affected by the hypothetical hazard)
7. Personnel to conduct and evaluate the exercise: Observers, controllers and evaluators
8. A Directive. A simulation exercise directive is a document with the following information: The objectives of the exercise
    a. Place and time of the exercise
    b. The hypothetical disaster scenario
    c. The emergency plan and/or procedures that are to be tested
    d. The equipment that is going to be used

    e. The task forces/response personnel involved
    f. Names of controllers, observers and evaluators
9. Simulation exercise memoir. A simulation exercise memoir is a document that contains:
    a. The simulation exercise directive
    b. The exercise evaluation. A simulation exercise is useless without an evaluation. Plan, procedures, personnel, vehicles and equipment performance must be evaluated comparing the ideal response (planning) to the one given in the exercise. Recommendations must be given in order to improve the plan and procedures, get more personnel, train better the task forces and acquire or improve the equipment.
    c. The recommendations given
    d. The description of the modifications/additions/improvement of planning and resources.

The simulation exercise memoir must be kept by the NDMD as a document to be studied and used for further exercises and as a historic resemblance of all simulation exercises performed and they results.

Simulation exercises can be planned and organised through time according to priorities in a National Simulation Exercise Programme that includes all the planned simulation exercises needed in a specific period.

The main responsibility for the co-ordination and evaluation of simulation exercises lies on the NDMD as the co-ordinating organisation of the whole disaster management process; however, each organisation responsible for each function is responsible for testing their own personnel, equipment, vehicles, materials and planning according to the Plan and its Procedures; i.e., All organisations responsible for specific response and relief activities considered in this plan have to test their own personnel, emergency procedures, material resources and vehicles through simulation exercises they have to plan and execute.

62.- Record of Real Events

The true test of an emergency plan is a real event. Personnel, other resources and planning are tested under real emergency and disaster circumstances; then, we can know if what we plan was right, if our resources were enough and the right resources, if our personnel was adequately trained, etc. Therefore, all real events have to be evaluated to see what happened and what went right and what wrong. This is done with the purpose of improving the plan and its resources, so in the next real events the response would be better and better. If we do not improve our planning after every real event, our planning is useless any lessons learned are just a list of errors that will certainly occur repeatedly in every real event.

Information about real events has to be recorded. At least the following information has to be included:

1. Hazard characteristics
2. Effects/damage/consequences
3. Response given
4. Evaluation of the response
5. Recommendations
6. Amendments to the plan/improvement of resources.

The main responsibility for keeping the records of these events lies on NDMD as the Co-ordinating Organisation of the whole disaster management process; however, each organisation responsible for each function is responsible for keeping their own records about real events, response given, results and lessons learned in order to improve their own procedures and the Plan.

It is very important to highlight the fact that a real event does not only mean a catastrophic disaster. An event can only be the issue of a hurricane watch or a hurricane warning without any impact. The warning may have implied a 'pre-strike meeting' and for sure implied communication and notification activities; sometimes even allocation of contingency funds or any other activity consequence of the immediate threat of a tropical cyclone. All these activities have to be evaluated and improved. All this warnings must be seen as invaluable opportunities to test the plan and its procedures. The issue of an island wide warning is a real event too.

APPENDIX –A HURRICANES

THE NATURE OF HURRICANES

1. DEFINITIONS

Hurricane. A hurricane may be described as a cyclonic storm of great violence in which the winds achieve great speed of motion revolving anti-clock-wise (in the northern hemisphere) more or less symmetrically round an area of low atmospheric pressure, while moving slowly over the surface of the sea. The winds of a hurricane increase in volume the nearer they are to the centre of calm round which they revolve. A hurricane is usually accompanied by high seas, thunder and lightning and torrential rain.

(ii) Area of Storm. A more or less circular area, covered by the hurricane which at any given moment is subject to storm disturbance.

(iii) Line of Progression. The direction in which a hurricane moves across the earth's surface represented by an imaginary line drawn through the centre of the storm.

(iv) Centre of Storm, Eye of Storm, Area of Calm. These various names are given to the central calm area of low atmospheric pressure round which the winds revolve.

(v) Right and Left Storm. The line of progression bisects the storm halves, and the terms right and left are applied respectively to portions to the right and left of this line as an observer would lock along the line facing the direction in which the storm is moving. The point where the centre of the storm strikes is the centre and the coast line is called right and left of storm as if the observer had his back to the oncoming storm.

(vi) Right Semicircle, Right Half. The part of the storm on the right of the line of progression.

(vii) Left Semicircle, Left Half. The part of the storm on the left of the line of progression.

(viii) Right Front Quadrant, Right Rear Quadrant. The front half and back half, respectively, of the right semicircle of the storm.

(ix) Left Front Quadrant, Left Rear Quadrant. The front half and back half, respectively, of the left semicircle of the storm.

(x) The Trough. During the passage of the centre of the storm the barometer falls to its lowest paint and begins to rise as soon as the centre has passed. If the centre does not pass over the observer the lowest point reached by the barometer marks the trough. It will occur when the centre of the storm is in a position in relation to the point of observance, of making a right angle with the line of progression.

(xi) The Track or Path of the Storm. The route the storm has taken, and therefore plotted after the storm has passed.

2. THE GENERAL PATTERN OF HURRICANES

While it is not possible to lay down hard and fast rules as to how a hurricane will behave, they tend to follow a fairly regular pattern and the following paragraphs will set out the general facts that are known about them.

(i) The speed of hurricanes. It is estimated that the average speed of a hurricane along the line of progression is 12 to 4 knots, but the speed depends on the size, the more intense the hurricane the slower its advance. It also moves at a greater speed when travelling in a straight line than when it is curving.

(ii) The diameter of hurricanes. There is considerable variation - from 50 to 500 miles have been recorded - the average might be taken as about 100 – 120 miles.

(iii) The length of time of a hurricane takes to pass a point of observation depends on the rate of progress and the diameter. There is therefore, wide variation but the usual time is about nine or ten hours. This is the full time of the storm winds. The duration of the destructive winds will be from two to three hours.

(iv) The average life of a hurricane is about eight days.

(v) The line of Progression in the Northern Hemisphere is straight or parabolic curving North, except for hurricanes occurring in the Western Caribbean the general line of storm is from east to west curving northwards,

(vi) The area of calm is a period of relative calm, possibly exaggerated by violence that precedes and follows it. It is marked by the suddenness with which comes and goes. During this period there is a marked drop in the atmospheric pressure and in the relative humidity, but there is a sharp rise in the temperature. There conditions last only as long as the period of the calm.

(vii) The diameter of the area of calm varies with the size of the storm, but the average width is estimated to be about 15 – 20 miles.

(viii) The length of time the area of calm takes to pass a point of observation depends on its size and the rate of progress of the storm and also whether the point of observation is in the exact centre of the calm. An area of calm moving at 12 miles will take two hours to pass a point of observation on the line of progression. This time will be progressively shortened until no period of calm is experienced as the point of observation is moved to the right or left of the line of progression.

(ix) The sources of hurricanes which visit the West Indies are extremely varied, and may be almost anywhere between 5 and 23 degrees North over the Atlantic or the Caribbean. The most common locations are to the east of the Lesser Antilles or in the Western Caribbean.

3. SIGNS OF APPROACH

The main phenomena to look for on the approach of a hurricane are as follows:

(i) Sea Swell. One of the earliest signs of a hurricane is the rising of a swell at sea and this may be noticed when the storm is as much as 400 to 500 miles away. The period

of the swell is long but very definite and causes heavy surf on the coast facing the oncoming storm. The breaking surf has a distinctive booming note but as the storm approaches the sea becomes more and more boisterous so that the result of the swell is less marked.

(ii) The Tides. As a hurricane approaches a coastline there is a tendency for the t ' ides to be abnormally high and to lack full ebb. The reason has been given that the storm waves approach tends to reinforce the gravitational tides thus accentuating the high tide and cancelling out the low.

(iii) Barometer Pressure. In the tropics the diurnal rise and fall of the barometer is very marked and very regular. A hurricane approaching will upset this regularity. It may be preceded by a ridge of high pressure, in which case the barometer will rise higher than the normal, then fall to below normal. As the hurricane comes nearer, this drop will become increasingly sharp.

(iv) Temperature. As a rise temperature does not give any real indication, but there is a tendency for the day temperature to rise more than normal while the night temperature is somewhat lower. However, with the dropping of the wind, the feeling of heat may be exaggerated by the oppressive atmosphere.

(v) Cloud Formation. If the hurricane is preceded by a ridge of high pressure the weather will be fine and there will be little or no cloud. The first advance appearance of the storm may be high flying Cirrus or Mare's Tail clouds. These clouds travel In advance of the storm usually along the line of progression and the paint on the horizon from which they appear to diverge is paid to indicate the position of the centre of the storm. As the storm approaches a thin haze or veil of cloud begins to form and spreads from the direction from which the Cirrus clouds have come. The veil called “cirrose veil", thickens rapidly until the Cirrus clouds are obscured. Dense black clouds masses will then make their appearance.

(vi) Winds. During the early stages, the wind will be high and variable particularly if there is a ridge of high pressure. As the general weather conditions deteriorate the winds will continue light but become more gusty until the storm is definitely getting close when it will start blowing from a definite quarter. It will then gradually increase in violence and gustiness, its direction depending on the position of the centre of the storm.

(vii) Other indications. At night there may be a halo round moon and the brighter of the stars and by day a halo is sometimes seen round the sun.

The sunrise and sunset are said to be exceptionally brilliant even by tropical standards and have a marked reddish colouration.

The general atmosphere is oppressive, an illustration of the lull before the storm.

4. PASSAGE OF STORM.

During the approach of the hurricane there is usually little or no rain but as the violent winds of the storm itself arrive there are heavy showers Interspersed with drizzle and the barometer falls abruptly.

The direction of the wind and its force as has been explained above will vary considerably during the storm and depending on the exact quarter of the storm passing over. The nearer the centre of the storm the more violent and destructive will, be the wind and the: rain will he torrential during the first half and the seas mountainous. If the centre passes over the Island there will be a brief lull in which the barometer will reach its lowest paint. After the lull the storm will start up again with great violence with the winds in the opposite direction. The rain will not be so torrential after the passage of the centre and the winds will gradually die away and the barometer rise.

5. HURRICANE DAMAGE

The destructive force of the winds of a hurricane are well known but the records show that the greatest loss of life and damage to property occurs in places where the visits of the are so infrequent as to give rise to the belief that the place is almost immune which breeds an attitude of mind that though disasters happen elsewhere - "It never happens here".

This was amply demonstrated when Hurricane David struck Dominica on 29 August 1979. A generation had almost passed away since the hurricane of 1928 and except for few eyewitness accounts told now and then, most people of middle age had no recollection of the 1928 hurricane.

It is in areas that suffer from frequent hurricanes that the most adequate precautions are taken and loss of life reduced to a minimum thereby. Buildings are built to be storm-proof and on sites that are well above the reach of the Storm Waves. Care should be taken to build houses of suitable material and of a design that will give adequate protection during heavy winds and storms.

The destructive forces of a hurricane are mainly:

(i) The force of the wind
(ii) The storm wave
(iii) The torrential rain
(iv) The lightning

(i) Damage by the wind. Damage by the wind includes the incidental damage that arising from wind action - that is damage from flying debris or damage to building from falling trees that make an opening for the wind to wreck the house. The force of the wind uproots trees and growing crops, breaks branches and blow over or demolishes flimsy buildings. Roofs that are not built to withstand the storm are torn off especially if they offer large areas to the full force of the wind and are not anchored. The wind may carry the debris with destructive force for considerable distances and damage other objects that otherwise might have been unharmed. The chief danger to persons arises from the collapse of buildings, from being blown-over by the force of the wind or injured by flying debris. Shelter should therefore be taken against the wind and by the same taken, from flying debris and the shelter should be as secure as possible in a building likely to stand. The use of corrugated iron adds greatly to the potentialities of injury and damage.

Once the wind has forced a window or door it exerts a force on the weak part of the structure that is on the underside of the roof and the destruction of the windows is the first step in the demolition of the house. For this reason all windows and doors should be provided with shutters that can be barred. An eye-witness of the 1931 hurricane in Barbados recommended that if a window was blown in on one side of the house the best thing to do was to open one on the other side to allow the wind to escape instead of offering resistance.

It must not be forgotten that danger to the person continues after the hurricane has died down, from wounds, however slight, that may become infected and many persons have been known to die from tetanus which arose out of ill-attended wounds received during a hurricane.

(ii) Damage from Storm Waves. It is reported by Tamehill that more than three-quarters of the casualties caused in hurricanes have been due to drawing in the storm waves following inundation of low-lying, thickly populated coastal areas. The rising sea sweeps away the buildings, roads and bridges, undermines foundations of solid buildings that would otherwise have stand and 'throws wreckage of debris with devastating force against all types of structures.

The sea waves meeting the torrential waters from the rain making for the sea will add to the destruction. Drains are likely to be blocked and as the water must find an outlet the weakest structures will go.

(III) Damage by rain. The damage by rain will be similar to that caused by the sea except that it will not be confined to coastal areas. It is probable that houses will be undermined and roads and bridges swept away by the rush of water making for lower levels and pouring down from the higher ground. A fall of one inch of rain over an acre amounts to 113 tons of water and anything from 10 to 15 inches may be expected so that the weight of water per acre may be between 1,130 and 1,695 tons. There will be serious flooding in the low lying ground. The sudden precipitation of water is likely to cause serious landslides due to the overloading of the earth's surface and the weakening of the substrate. Persons living in low lying valleys near to river courses and low lying beaches should be prepared to leave at an early stage and seek shelter on high ground. Shelter should therefore not be taken in any low lying area liable to flood.

Damage to water pipes and other underground installations will be extensive and before these can be restored the water is likely to become contaminated and not safe to drink.

(iv) Damage from Lighting. Lightning may cause fires which the high winds would tend to spread and make control more difficult. However, the general result of the rain and the flooding should play their part in controlling the spread. Far more serious would be a fire to the petrol storage tanks as the blazing oil will float.

6. GENERAL CONDITIONS

The general conditions that may be expected after a severe hurricane may be summarised:

(i) Extensive damage to buildings rendering thousands homeless and without shelter, food, water of additional clothing.
(ii) Heavy casualties, the killed to be buried speedily to prevent the spreading of epidemics, the injured to be treated.
(iii) Almost complete destruction of crops.
(iv) Roads swept away or rendered impassable by debris, making rescue and relief work difficult.
(v) Water supply disrupted by broken mains and standpipes and contamination of well supplies with possibly brackish supplies in coastal areas. .
(vi) Heavy damage and blockage of the wharf front by wrecked schooners and small craft.
(vii) Electricity and Telephone services out by damage to installations and main buildings, overhead cables destroyed and underground piping damaged.
(viii) Telegraph and telephone systems may be out of action which would disrupt communications outside the Island.

7. ADVISORIES AND WARNINGS

The Meteorological Office at Golden Rock International Airport will issue statements concerning the approach of hurricanes and storms. The statements will contain the following weather words, as appropriate.

BULLETIN Issued when a significant weather system in detected in the area.

ADVISORY issued at regular intervals when a tropical storm or hurricane is first detected in the area – keep listening.

ALERT issued when a hurricane or tropical storm is likely to impact Nevis within 48 hours.

WATCH issued when the hurricane continues its advance and hurricane conditions are a real possibility and it is likely that impact will occur within 36 hours.

WARNING issued when once it is established that hurricane impact is expected within 24 hours.

TROPICAL DEPRESSION a Tropical System with a circulation but with winds of less than 39 m.p.h. (34 knots.)

TROPICAL STORM a Tropical System with a circulation and winds of 39 - 73 m.p.h. (34 - 36 knots.)

HURRICANE an Intense Tropical System with maximum sustained winds greater than 74 m.p.h. (64 knots.)

EYE the relatively calm area near the centre around which the strongest winds blow. As the eye passes light winds

rapidly give way to very severe winds from the opposite direction.

STORM SURGE — the rise of water (as high as 10 to 20 feet) above sea level brought on by the strong winds and low pressure in the storm centre.

8. WARNING SYSTEM

1. The Hurricane season usually extends from June to November. During this time it is wise for everyone on the Island to be on the alert that precautionary measures, previously planned are put into effect as soon as information is received *of* an approaching storm.

2. When a Hurricane is near, the gusts of wind become stronger and more frequent and they are accompanied by torrential rain. Sooner or later the full destructive force of the storm strikes the island. If the centre of a hurricane should pass over the island the first blow will be succeeded by calm of half an hour or an hour or less after which terrific gusts of wind would suddenly blow from the opposite direction. During the calm, opportunity should be taken to carry nut further precautionary measures possible because it has been established that it is the second blow - from the opposite direction - which usually causes the greatest damage.

3. If a hurricane is approaching, the Antigua and Barbuda Met Office will notify the Nevis Met office. The Nevis Met Office will notify the NDMD about an alert, watch or warning. The Nevis DMD will immediately and officially notify all members of the National Disaster management Committee and ensure a message is broadcast to the public. Depending on the magnitude of the threat, this message should be issued by the Premier.

9. TYPES OF WARNING

The types of warnings issued are:

(i) Flood, (ii) flash flood, (iii) small craft (advisories and warning), (iv) gale, (v) storm (or whole gale), (vi) hurricane watch, (vii) hurricane warnings, (viii) special coastal warnings.

Flood Warning. When flooding is expected in low lying areas and near the river banks due to a continuous downpour of rain (of many hours duration) a flood warning will be issued. This warning is not necessarily associated with Depressions, Storms or Hurricanes, and strong winds do not always accompany the rain.

Flash Flood Warning. When sudden, very heavy or violent rainfall is expected to occur, bringing a sufficiently large amount of water to cause flooding in a short time, a flash flood warning will be issued. As with the flood warning, this is not necessarily associated with Depressions, Storms, or Hurricanes.

Small Craft Advisory. When above normal winds, sea swells or wind driven waves are affecting St Kitts and Nevis and surrounding waters, with conditions just marginally safe for

small craft operations, a small craft advisory will be issued as a caution. These conditions are caused by various meteorological systems including Depressions, Storms and Hurricanes.

Small Craft Warning. When a Hurricane, Storm or Depression moves within a few hundred miles of the coast or when condition caused by other systems are considered unsafe, with winds up to 38 miles per hour (33 knots), warning will be issued for small craft operators to take precautions and not to venture into the open sea.

Gale Warning. When winds of 39 to 54 miles per hour (34 - 47 knots) are expected to affect the island within 24 hours, a gale warning is added to the advisory message. A gale warning may be issued when only the fringe effects of the Hurricane are expected to be felt.

Storm Warning. When winds of 55 to 73 miles per hour (48 - 63 knots) are expected to affect the island within 24 hours, a storm warning is added to the advisory message.

Hurricane Alert. A hurricane watch will be added to the advisory message when there is a threat of hurricane conditions affecting the island within 36-48 hours. A hurricane alert means that hurricane conditions are a real possibility; it does not mean they are imminent. When an alert is issued, everyone in the island should be prepared to act quickly if a hurricane watch is later issued.

Hurricane Watch. A hurricane watch will be added to the advisory message when there is a threat of hurricane conditions affecting the island within 24 - 36 hours. A hurricane watch means that .hurricane conditions are a real possibility; it does not mean they are imminent. When a watch is issued, everyone in the island should be prepared to act quickly if a hurricane warning is later issued.

Hurricane Warning. When hurricane conditions are expected to affect the island within 24 hour, a hurricane warning will be added to the advisory message. Hurricane conditions include winds of 74 miles per hour (64 knots) or more, and/or dangerously high tides and waves. Hurricane Warnings are seldom issued more than 24 hours in advance. If the hurricane's path is unusual or erratic, the warning may be issued only a few hours before the beginning of hurricane conditions. Local precautionary actions should begin as soon as hurricane warnings are issued.

Special Coastal Warnings:

Hurricane tides and surge. Major hurricane swells travel great distances ahead of the centre and may cause a rise in the level of the sea along the shore called the hurricane tide. While the hurricane is still some distance away, warnings would be issued to beach goers (along with those for small craft). A wave front produced by the hurricane will bring a considerable mass transport of water towards the shore. The rise in the water level in this case is a rapid phenomenon, occurring near the area where the eye makes landfall, and about the same time. This is called the hurricane surge (or storm surge in the case of that system) and can bring tidal waves 15 to 20 ft (sometimes higher). The surge can enter the mouths of rivers and move a considerable distance and loss of life is usually caused by surge, which is the primary reason for recommending the evacuation of low - lying areas. Warning against the hurricane surge is not likely to be given a long time in advance.

10. WARNINGS TO THE PUBLIC

1. Radio Announcements
Announcements will be made over the radio.

2. Other signals of two types:

By day	-	two flags showing a black square and a red ground, flown one above the other at mast heads
By night	-	two red lights, one above the other, hoisted at mast heads

3. The Superintendent of Police is responsible for the following Visual Warning Stations:
Flags will be hoisted at the following Police Stations:

Charlestown Police Station
Cotton Ground Police Station
Newcastle Police Station
Gingerland Police Station

4. Audible Warnings

(a) Bells
Church Bells will be rung rapidly at intervals for a period of fifteen minutes.

(b) Sirens
Sirens controlled by the Superintendent of Police will be sounded every quarter hour for an hour in blasts of one minute, three times with an interval of half a minute, between blasts at all following Police Stations:

Charlestown
Newcastle

All Clear Signals

5. When it is certain that the island is out of danger from the hurricane "All Clear" signals will be given. These signals will be given as follows:

(a) Visual - By day - A green flag with a white diagonal stripe flown at mast heads
By night - A green light at mast heads

(b) AudibleSirens will be sounded continuously for three minutes
Police will advise District Emergency Organisations, Rectors and Vicars, and will notify residents of isolated districts
Reports will be made over the radio.

11. HURRICANE PRECAUTIONS

1. Before the Hurricane Season

a. At the approach of the hurricane season make sure that all fasteners for outside doors and windows are in order. If possible, windows should be reinforced with shutters

and doors with bars. This also applies to buildings in which cattle and livestock are to be housed.

b. Lay in a small amount of tinned milk and other tinned foods as emergency rations.
c. Keep one or two hurricane lanterns filled with kerosene with matches and candles in readiness. Also keep in stock a supply of firewood and charcoal for cooking purposes.
d. A small quantity of first aid supplies may come in useful.
e. Make yourself acquainted with the system of warnings.
f. Make sure that you know the emergency shelter for the area in which you live.
g. Keep your radios on and listen for late warnings and advisories.
h. Pay no attention to rumors.

2. <u>After the Cautionary Warning</u>

a. The cautionary warning will give you ample time in which to make your final preparations and to see your supplies are near at hand.
b. Fill as many clean receptacles as possible with water for drinking.
c. See that all cattle and livestock have plenty of water and food and fasten them securely in suitable buildings. If no buildings are available let the cattle and livestock fend for themselves and do not tether them.
d. Ensure that your emergency food supplies and first aid are in order.
e. Buckets of sand might also be prepared in case any fire breaks out.
f. It is a good plan to paste strips of paper over glass windows during this period, particularly if there are no shutters. This will strengthen the glass and minimise splintering.
g. Secure all loose material that may be in the yard.
h. All boats should be drawn up well above high water mark,

3. <u>After the Final Warning</u>

a. Shut, fasten and barricade all windows and outside doors and do not open them until the hurricane has passed.
b. Take cover in as secure a shelter as possible. Certain churches, schools and public buildings may be open for those wishing to shelter in them.
c. If you go to shelter in any of these buildings take some food with you.
d. Do not shelter in ravines or low lying areas that are likely to flood.
e. If you live in Charlestown or on a main road you can assist by removing from the road outside your house the smaller debris. This will make the work of the Organisation responsible for opening up communications and dealing with major obstructions a little easier.
f. Do not congregate in roads and thoroughfares.
g. Do not crowd round relief centres needlessly.
h. Do not use your car unless you have a job or work to do.
i. Do not go sightseeing - In any case the sights will not he pleasant.
j. Assist the members of the Emergency Organizations as much as possible when asked to do so.
k. The immediate concern is for the injured. Those requiring treatment should go or be taken to the nearest dispensary or police station. If they are ton seriously injured to be removed give information to the Dispensary or the nearest Police Station.
l. Report any deaths at the Police Station giving as much information regarding identity as you can.

m. If you are rendered homeless and can make no other arrangements, the police will direct you to the emergency shelters or to your local relief centre.
n. If you live in a low lying area be prepared to move to high ground. Those in coastal areas should move further inland. There will probably be high seas.
o. Do not leave the shelter if there is a sudden lull. This may be the centre and the wind will blow again from the opposite direction.
p. If shelter is taken in a house that shows signs of collapsing the best place to take cover is under the stairs or under a stout table or bedstead.
q. Do not go outside during the hurricane.
r. If you are taking shelter in a cellar take with you your supplies of food, water, lanterns, matches, etc. Do not forget a tin opener.
s. An axe or other suitable tool is also useful in case the entrance gets jammed.
t. A bucket or other receptacle with sand and disinfectant should be provided for sanitary purposes.

4. <u>After the Hurricane</u>

Never drink the water without boiling and, if possible filtering until the authorities have declared it safe to drink.

APPENDIX B HURRICANE SUPPLIES

WATER - An adult will need a minimum of 1 litre (35 ozs.) of clean drinking water per day. One gallon (128 ozs.) per adult is a better quantity per adult per day when he is active in tropical sun. Man will die in three days without water, but will survive about ten days without food. Keep water in a sealed, clean plastic container such as the containers used to package vinegar and cooking oil, or the 25 lb plastic salt meat pails). If you have to use water from land boil for at least ten minutes before drinking.

FOOD - Stock items that do not require cooking and provide food supplies for your family for at least ten days. In case of a hurricane, public feeding with hot meals is unlikely until day five - except for injured, infants and young children.

1. Corned Beef
2. Sardines
3. Luncheon Meat
4. Peanut Butter
5. Jam/Jelly/Honey
6. Biscuits
7. Salt - body needs daily salt to avoid cramp
8. Fruit Juice
9. Raisins/Currants/Dates - dried
10. Rolled Oats
11. Chocolate Bars/Barley Sugar
12. Condensed Milk
13. Sugar
14. Toilet Paper

FIRST AID KIT

1. Band-aids
2. Bandages
3. Scissors/tweezers/needles/safety pins
4. Alcohol
5. Cotton-wool/lint
6. Aspirin or other Analgesic
7. White Petroleum Jelly/Antiseptic Ointment
8. First Aid Book

TOOLS

1. Waterproof Flashlight - spare batteries/bulbs
2. Hurricane Lantern - Kerosene oil
3. Other safe lighting (NOT candles)
4. Matches - waterproof container/plastic bag
5. Hammer - professional with claw
6. Wood saw - 3 ft cutting edge
7. Nails - 21b 2”, 2 lb 4”, galvanised drive-nails
8. Waterproof plastic – 12’ x 12’
9. Cutlass/axe

10. Rope - nylon - about 50’ x ¼”
11. Pen-knife (heavy duty)

MISCELLANEOUS

1. Transistor Radio - spare batteries
2. Note Book - pencils/pens
3. Map of St. Kitts and Nevis
4. Stove - Oil, Gas - Camp type
5. Metal cup/plate/spoon/cooking pot
6. Needle, thread, buttons, etc.

CLOTHES

1. Raincoat and Rain Hat
2. Umbrella
3. Tennis Shoes/Rubber Boots

APPENDIX C VOLCANIC ERUPTIONS

PART I

1. DEFINITIONS

(i) Volcanic Eruption. A Volcanic Eruption involves the escape at the surface of molten rock (magma) which has risen from a zone of melting several tens of kilometres below the surface. The magma generally contains a much larger volume of gas than liquid and the gas, before it emerges at the surface, is under very high pressure. The more gas present the more violently explosive will be the eruption.

(ii) Area Affected. The area severely affected by a large volcanic eruption will normally be no more than 10 km is radius around the active crater or vent. Within this area certain parts can be specified (especially the deeper valleys originating at or close to the crater) which are particularly liable to suffer damage as will be explained in detail later.

iii) Glowing Avalanche is a type of eruption involving the emission of dense clouds of solids (ash and cinder or lava blocks) suspended in very hot gas. Because of their high density, glowing avalanches flow downward away from the active vent in much the same way as milk boils over the side of a saucepan. They follow the easiest route downhill i.e. the major valleys down the flanks of the volcano.

(iv) Ash-fall consists of material blasted vertically upward from the vent in a high pressure gas column. This rises to many thousands of metres in height and the fragments fall as showers. The larger blocks tend to be blown less high and therefore fall closer to the active vent, whilst the fine dust may be carried downwind for hundreds of kilometres.

(v) Mudflow is composed of solids (ranging in size from dust to blocks of several metres in diameter) suspended in water. A mudflow is caused either by the ejection of a crater lake, or by temporary damming of a river, or by torrential rain (which often accompanies large eruptions) which washes newly fallen ash off the upper slopes of the volcano. Mudflows, like glowing avalanches, follow the easiest route downhill. Their temperature will not exceed that of boiling water (100 c) i.e. they will be considerable cooler than glowing avalanches.

2. DETAILS OF THE GENERAL PATTERN OF VOLCANIC ERUPTIONS IN THE WEST INDIES

(i) The size of an eruption depends upon the volume of magma within reach of the surface. This volume in large eruptions may amount to several cubic kilometres.

(ii) The explosiveness of an eruption depends upon the abundance of gas which may range from an insignificant amount (as in the very mild eruption in St Vincent in 1971) to enormously more than the volume of magma (as in the violent eruptions of 1902 in St Vincent and Martinique). From historic accounts and from reconstructions of prehistoric activity it is clear that West Indian eruptions are among the world's largest and most violent.

(iii) The frequency of West Indian eruptions fortunately is relatively low. At a single volcano they recur at intervals ranging from several tens to several thousands of years. Those relatively long periods of dormancy are compensated by the extreme violence of the larger eruptions.

(iv) Physical characteristics of a typical large eruption

In a typical explosive eruption there are two main directions in which material is ejected from the vent. Firstly there is a vertical eruption column which during the strongest explosions may rise 10 - 20 kilometres high carrying large (e.g. football sized) blocks or clots of semi-consolidated lava one or two kilometres high and finer ash to the full height of the eruption column; secondly, there are glowing avalanches which travel downward away from the active vent and which follow the easiest routes downhill on the flanks of the volcano. These avalanches consist of expanding dense clouds of semi-molten lava fragments and ash in hot gas. They travel very quickly: speeds of over 100 kph (60 mph were recorded during the 1902 eruption of Mount Pelee in Martinique. In moderate sized eruptions these glowing avalanches may sweep down only one or two of the larger valleys which begin at low points on the rim of the active crater. If, however sufficiently large volumes of glowing avalanche material are erupted in a short space of time the avalanches will radiate in all directions down the flanks of the volcano.

It is the flowing avalanches which have caused the major loss of life and destruction of property by West Indian volcanoes in historic time. Human casualties have been caused either by dismemberment (in the same way as from a bomb explosion) as was common in the city of St. Pierre in Martinique in 1902 where most buildings disintegrated and were razed to foundation level by the blast of the avalanche. Alternatively death may be caused by asphyxiation as appears to have been the predominant case in St Vincent in 1902 where casualties were attributed to the inhaling of very hot dust-laden gas.

In summary, the main features of glowing avalanches which make them so lethal are that: -

(a) They travel too rapidly to allow people to escape their paths between the time of their emergence from the summit and their arrival at the foot of the volcano;

(b) They are capable of striking with sufficient physical force to destroy ordinary wooden or masonry buildings or at least to set them on fire. Thus there is no simple alternative but to evacuate threatened areas before the volcano emits glowing avalanches.

A third type of eruptive phenomenon which is smaller in numerous respects to glowing avalanche is the mudflow. This can originate by the ejection of a crater lake (as in St Vincent in 1902) or it can be generated during or after the eruption of ash-fall or glowing avalanche if heavy rain washes large quantities of watery mud down the valleys on the flanks of the volcano. This mud may be very hot, i.e. at temperatures near boiling. Like the smaller glowing avalanches mudflows travel down the main valleys on the volcano. However the extent of the areas they affect and also their temperature will appreciably less than those of glowing avalanches.

The time sequences in which the above types of activity occur varies considerably from one eruption to another even at the same volcano. The duration of a single period of eruption may be as long as several years and may include periods of several weeks or months in which no significant emission occurs.

PART II

PREMONITORY SIGNS THAT GLOWING AVALANCHES

MAY BE ERUPTED IN THE EARLY FUTURE

There is no way of reliably predicting the day or the hour of individual glowing avalanches. Once a West Indian volcano has entered a phase of strongly explosive activity, however it is probable that glowing avalanches will be erupted and that there may be several such avalanches large enough to pose a threat to life and property on the lower flanks of the volcano, at irregular intervals over the ensuing months. The sequence of events of events which lead up to the emission of glowing avalanches in Martinique and St Vincent in 1902 consisted of several months of local earthquakes (i.e. tremors originating at shallow depth beneath the volcano) and several days of increasingly large vertical explosions from which fine ash and pumice lumps showered the lower flanks of the volcano.

Thus for all practical purposes, the hazard to the local population becomes serious as soon as strongly explosive eruptions of any kind begin. In one or two historical cases at volcanoes of similar type of these in the West Indies e.g. the 1929 eruption of Komagatake Volcano in Japan, glowing avalanche emission has begun within a few hours of the first ex plosive activity. It is therefore desirable that the onset of explosive activity itself should be predicted in order to allow adequate time for an orderly evacuation from the most threatened areas.

PART III

DAMAGE CAUSED BY VOLCANIC ERUPTIONS

The damage caused in the direct path of a glowing avalanche will be virtually total: buildings will be razed and set on fire or they may be buried under hot volcanic ash many metres will be equally decimated. On the flanks of a glowing avalanche e.g. on the ridges adjacent to the main valley down which the avalanche travels, buildings will remain intact but their human occupants may be asphyxiated by the hot dust-laden gas unless all doors and windows are well sealed.

Any human being exposed (i.e. outdoors) even to the fringes of the hot gas cloud will, if not asphyxiated probably suffer, severe burns both externally and to the respiratory system. Thus the only effective protection from glowing avalanches consists in avoiding the areas where they are likely to occur.

The damage from ash-fall and mudflow will in most cases be relatively small compared with that from glowing avalanches. With ash-fall the occasional casualty can be expected from larger fragments falling at high velocity. Damage to houses will consist mainly of the caving in of roofs under excessive loads of ash whilst occasional fires may be started by red-hot fragments.

Mudflows represent a hazard to anyone in the valleys which they descend. Their temperature and/or depth may be sufficient to make it impossible to wade through them and thus they may block escape routes around the flanks of a volcano, as was the case in the opening stage of the 1902 eruption in St Vincent.

PART IV

WARNING SYSTEM

The earliest warning of major volcanic eruptions will hopefully come weeks or months before the destructive climax e.g. in the form of small but frequent earthquakes at shallow depth beneath the dormant volcano. Most of the earthquakes will be too small to be felt, but there will be many large enough to be detected by sensitive seismographs. For this reason, at least one seismograph is kept in continuous operation in each volcanic island served by the UWI Seismic Research Unit. There may also be an increase in steam flow and a temperature at natural streams around the volcano before an eruption begins.

As soon as any abnormal activity of this kind is detected, additional monitoring equipment will be installed in the island of the Seismic Research Unit. The rate of progress of events towards a possible volcanic eruption can then be followed, although this will probably not approach the relatively steady rate at which, for example, a hurricane approaches. The period over which activity builds up to climax may vary from a few days to many months end may involve intervals of accelerating and decelerating activity. However once events are being monitored as fully as possible there is a good chance that at least a few day's warnings can be given of any destructive climax.

In the case of Nevis, the Seismic/Tsunami/Volcanic Sub-Committee will design a specific volcanic eruption response plan; t will include a specific warning mechanism for the case of a volcanic eruption threat. The NDMD is responsible for notifying about an impending volcanic eruption in Nevis to all the members of the Nevis Disaster Management Committee, based on scientific information provided by UWI and other institutions.

PART V

1. SIGNS OF ERUPTION

(i) Earthquake occurring around the volcano in nearby districts before an eruption.
(ii) Steam issuing from the mouth of the volcano.
(iii) Floods of water and mud appearing in the rivers making them impassable.
(iv) First steam explosion after twelve hours of the first three signs.
(V) A few hours after the floods "pyroclastic flows" will cover much of the mountain.

2. REPORTS OF UNUSUAL ACTIVITIES

Reports of unusual activities will generally come from:-

(a) Residents of the danger areas;
(b) The Seismic Research Unit in Trinidad;
(c) The Director NDMD.

These reports should be carefully examines and treated with great urgency.

Hurricane Watch. A hurricane watch will be added to the advisory message when there is a threat of hurricane conditions affecting the island within 24 - 36 hours. A hurricane watch means that .hurricane conditions are a real possibility; it does not mean they are imminent. When a watch is issued, everyone in the island should be prepared to act quickly if a hurricane warning is later issued.