PREFACE

The “Disaster Risk Reduction and Management (DRRM) Manual “for UP Manila and the Philippine General Hospital, serves as a practical guide for mitigation or prevention, preparedness, response, and post-disaster recovery or rehabilitation.

Efforts to develop the manual started in 2012, when the UP Manila Health and Safety Committee headed by the Vice Chancellor for Administration, Dr. Joselito C. Jamir, started to plan for a workshop as a response to the call of UP Manila Chancellor, Dr. Manuel B. Agulto, for the formulation of a UP Manila-wide Disaster Action Plan.

The workshop held at the UP College of Public Health last November 9, 2012 was attended by 108 representatives from UP Manila colleges, offices, units, and from the Philippine General Hospital. The workshop sessions enabled representatives from different UP Manila Colleges and Units to share their insights and views on how to deal with disasters. To improve coordination among UP Manila constituents, clustering was made for adjacent colleges and units.

The initial plan of the Subcommittee tasked for the development of this Manual, was merely to consolidate the various plans submitted by various colleges and units during the November, 2012 workshop. Upon consultation with concerned government agencies however, the importance of aligning our plans with the Philippine Disaster Risk Reduction and Management Plan was realized.

In July, 2013 technical working groups (TWGs) were organized to develop specific guidelines for disaster mitigation/ prevention, preparedness, response, and post-disaster recovery or rehabilitation in UP Manila.

On October 30, 2013 the specific guidelines for risk reduction and management (for fire, floods and typhoons, earthquake, bomb threats and others) were presented by the various TWGs during a Write Shop attended by representatives of concerned government agencies (such as the National Disaster Risk Reduction and Management Council, Bureau of Fire Protection, Phivolcs, etc.).

This first edition of the DRRM Manual for UP Manila and UP-PGH is the result of painstaking work by the designated writers in coordination with the abovementioned TWGs. After several series of meetings conducted by the Subcommittee for the development of this Manual, it is now time to present the results of their endeavours.

PERLA SARAUSAD-MACARAEG, MD., MSc.
Chair, Subcommittee for DRRM Manual Development
UP Manila Health and Safety Committee
MESSAGE

Let me start this message with a denial. This manual is not a knee-jerk response of UP Manila. Nor was it brought about by the spate of calamities like the Habagat floods for the last two years or the earthquake that hit Bohol and Cebu both of which occurred in the past couple of years. Rather it is the current administration's desire to come up with a document that may serve as a working model that may be used by organizations like ours.

UP Manila has an enviable opportunity because of the presence of the national premier hospital that is PGH within its walls. Furthermore, the health expertise consistent with its being the health sciences center brings to the fore the capabilities and competencies required to handle the post-disaster condition inherent in such events. From the curative aspects to the public health concerns as well as the allied health needs that form part and parcel of rehabilitation that can be handled by elements and personnel comprising UP Manila. Our behavioral sciences staff may provide the services that are a must in the management of post-traumatic stress caused by disasters. Better yet, we at UP Manila can meet the challenges posed by disasters both natural and man-made.

All these realities drove this administration to embark on formulating a manual that will address all possible disasters including man-made toxic and biological wastes. Even the proposed new NIH Building must consider these possibilities and tackle them accordingly. But the determining factor that necessitated the desired document is the predicted occurrence of a major earthquake that will hit Metro Manila within near future.

Thus this manual is envisioned to provide a document that may be used by the public, governmental and non-governmental organizations alike. For the past couple of years, UP Manila had been quietly doing things towards the accomplishment of this goal. Hopefully, we will be able to come up with the manual on disaster preparedness before the next catastrophe comes.

Let me end by saying to be forewarned is to be forearmed. The Boy Scouts also have as their motto “LAGING HANDA”. Let these two adages serve us well as we face life disasters and trust our Creator for our ultimate safety and salvation.

MANUEL B. AGULTO, MD
Chancellor
As the chair of the Committee on Health and Safety of UP Manila the task of quarterbacking the formulation of a manual on disaster preparedness has fallen on the shoulders of the Vice Chancellor for Administration. The committee had been meeting regularly about this manual. A workshop had been held already which produced the framework of the proposed manual, groups had been formed to write on the various types of disaster; drills are regularly conducted in accordance with pertinent laws in collaboration with other government agencies among others. Now we are in what may be considered as the homestretch of the task at hand. The write-shop is but a forum that will provide a venue for academics and expert technical personnel to sit together, discuss matters and arrive at a consensus on how to handle matters and cope with the situation.

The document that will be the product of this continuing activity may be beneficial to the country in general and to the local government units in particular. This will handle not only internal disasters in UP Manila but also external disasters, natural and man-made ones also that may require the technical expertise and services of UP Manila. This is UP Manila’s way of sharing with the Filipino people the knowledge that it has gained and the skills it has acquired in its more than a century of existence. UP Manila simply has to live up to its being the health science center committed to the service of the people especially the underserved.

From:  
Joselito C. Jamir, MD  
Chair & Vice Chancellor for Administration
Table of Contents

Preface--------------------------------------------------------------- i
Messages: Chancellor, UP Manila-------------------------------------- ii
Chair, UP Manila Health and Safety Committee------------------------ iii
List of Tables------------------------------------------------------- iv
List of Figures------------------------------------------------------ v
List of Appendices--------------------------------------------------- vi

Chapter 1. Introduction-------------------------------------------------

Chapter 2. Mandate for Disaster Risk Reduction and 
Management Plan at UP Manila----------------------------------

Chapter 3. Process Model and Organizational Structure for 
Disaster Risk Reduction Planning and Management at 
UP Manila----------------------------------------------------------

Chapter 4. The Incident Command System of UP Manila------------

Chapter 5. Guidelines for Fire-Related Emergencies---------------

Chapter 6. Guidelines for Flood and Typhoon-Related 
Emergencies---------------------------------------------------------

Chapter 7. Guidelines for Earthquake-Related 
Emergencies----------------------------------------------------------

Chapter 8. Guidelines for Explosives–Related Disasters----------

Chapter 9. Guidelines for Biological Hazard-Related Disasters------

Chapter 10. Guidelines for Radiation-Related Disasters------------

Chapter 11. Guidelines for Chemical-Related Disasters----------

Annexes:
1. Composition of the UP Manila Health and Safety Committee 
   and Subcommittee for the Manual---------------------------------
2. Scenes from the Workshop------------------------------------------
3. Scenes from the Write-shop----------------------------------------
4. Emergency Numbers---------------------------------------------------
List of Tables

Table 4.1  ERT Color Coding
Table 4.2:  UP-PGH Emergency Code Nomenclature Adopted by UP Manila
Table 5.1  Time Flow of Response in a Fire Drill
Table 6.1  Time Flow of Response in a Flood Drill/ Actual Flood Situation
Table 7.1  Philippine Destructive Earthquakes
Table 7.2  Time Flow of Response in an Earthquake Drill
Table 10.1 Security Groups and Source Categorization from PNRI Code of PNRI Regulations (CPR) Part 26
List of Figures

Figure 2.1  Recommended Organizational Structure for UP Manila/ UP-PGH Disaster Risk Reduction and Management

Figure 2.1.1  Flow Chart of Duties and Responsibilities, College/ Unit Disaster Prevention/Mitigation and Preparedness Team

Figure 2.1.2  Flow Chart of Duties and Responsibilities, College/ Unit Disaster Prevention/Mitigation and Preparedness Team (continued)

Figure 2.1.3  Flow Chart of Duties and Responsibilities, College/ Unit Disaster Recovery and Rehabilitation Team

Figure 3.1  Process Model for Emergency and Disaster Planning and Management in UP Manila

Figure 3.2  Organizational Structure for Disaster Risk Reduction and Management at UP Manila

Figure 3.3  Flow Chart of Activities and Responsibilities of the College or Unit Disaster Prevention/Mitigation Team

Figure 3.4  Flow Chart of Activities and Responsibilities of the College or Unit Disaster Preparedness Team

Figure 3.5  Flow Chart of Activities and Responsibilities of the College or Unit Disaster Recovery / Rehabilitation Team

Figure 4.1  Algorithm for Identifying the Incident Commander During Emergencies

Figure 7.1  Philippine Tectonic Setting (Source: OCD NDRRMC)

Figure 7.2  Liquefaction Hazard Map in Metro Manila (GMMA Project Report 2013)

Figure 7.3  Tsunami Hazard Map of Metro Manila
List of Appendices

2.1. Duties and Responsibilities of the Different Teams for Disaster Risk Reduction and Management

3.1. Template for Health Emergency Preparedness, Response and Recovery Plan (HEPRRP)

4.1. Evacuation Areas, UP Manila/UP-PGH

5.1 Recovery Procedures for Damp Books and Minor Emergencies

5.2. Recovery Procedures for Wet Books and Paper

5.3. Recovery Procedures for Computer Equipment

5.4 Collection Priorities for Disaster Recovery: Criteria and Format

6.1. NOAH Hazard Map indicating UP MANILA as a High Risk Areas for Floods

6.2. DOST PAG ASA Public Storm Warning Signals

6.3. DOST PAG ASA Color- Coded Heavy Rainfall Warning (HRW) Levels

6.4. DOST PAG ASA Thunderstorm Warning Levels

6.5. DOST PAG ASA Safety Tips in Preparing for Floods

7.1. Non Structural Mitigation for Earthquake

7.2. Evaluation Tool, Post- Earthquake Preparedness Drill

10.1. Contact Persons at PGH for Radiation- Related Emergencies

10.2. Operative Measures for the Proposed Emergency Operations Center, PGH

10.3. Guidelines for the Emergency Operations Center

Section 1 - Estimated Threshold Absorbed Doses for Deterministic Radiation Effects Following an Acute Exposure To Low-LET Radiation (adopted from NCRP 138)

Section 2 - Patient Specimens To Be Collected In a Radiation Incident (ORAU REAC/TS) FOR ALL SUSPECTED RADIATION CASES
Section 3 - Estimated Threshold Absorbed Doses for Deterministic Radiation Effects Following an Acute Exposure To Low-LET Radiation (adopted from NCRP 138)
Section 4 - Effects of Large Acute Doses of Radiation

Section 5 - Ranges for Significant Effects from Nuclear Explosion (NCRP 138)

Section 6 - Lymphocyte Count in Humans at 24 to 48 Hours Post Exposure to Radiation (NCRP 138)

Section 7 - Sources of Radiation (adopted from ACR, 2005)

Section 8 - Radiation Detection Instrumentation for Healthcare Facility Responders

Section 9 - OSHA Operations Level Training Documentation Requirements
Chapter 1: Introduction

Written by:
Perla Sarausad-Macaraeg, MD, MSc
Professor
College of Public Health, UP Manila

1.1. Disasters: A Growing Challenge in our Country Today

Disasters due to natural causes are frequent occurrences in the Philippines. This is because our country sits within the Pacific Ring of Fire and lies in the middle of the most active typhoon belt in the world, the Northwest Pacific, making it very prone to earthquakes, typhoons, floods and/or landslides. In the light of these geographic vulnerabilities, the Philippines has been described as “the world’s most disaster-prone country” and as “the most disaster-struck country”. In 1993, our country was cited by Asia Magazine as “the Calamity Centre of the World”.

On the other hand, man-made emergencies and disasters are also emerging problems in our country today, due to rapid migration to the urban areas and overpopulation aggravated by poorly constructed and unsafe building/housing facilities. In a megacity like Metro Manila, the occurrence of fire and other related emergencies causing damage to properties and undue loss of lives, are not uncommon.

In 2010, the Philippines ranked third in the ranking of countries in the world with the most number of disasters. As for countries with the most number of fatalities due to disasters, our country ranked fifth in the world.

1.2. Endeavors for Emergency Preparedness and Response, University of the Philippines Manila

Time Highlights

1982
- The first Emergency and Crisis Management Office was established at the UP- Philippine General Hospital (UP-PGH).
- The Emergency and Crisis Management Plan 1982-1992, which adopted the HEICS (Hospital Emergency Incident Command System) was crafted for UP-PGH.

1996
- UP Manila headed by Chancellor Perla D. Santos – Ocampo hosted the International Symposium on Disasters and Health held on October 16-18, 1996, in collaboration with the International Center for Medical Research of Kobe University, Japan.
2003 - The UP-PGH Emergency and Crisis Management Plan (Hospital Emergency Incident Command System) was revised.

2009 - The Emergency Preparedness and Response Committee was created as a Sub-committee of the UP Manila Health and Safety Committee.

2010 - The Emergency Preparedness and Response Committee started to facilitate a series of lectures, seminars and drills to enable all UP Manila Colleges and Units to deal with emergencies and disasters.

2012 - A Disaster Action Plan Workshop was conducted by the UP Manila Health and Safety Committee headed by Dr. Joselito Jamir, Vice Chancellor for Administration, to facilitate the development of a Consolidated UP Manila–Wide Disaster Plan.

- All UP Manila Colleges and Units were requested to submit their respective Emergency/Disaster Action Plans which were shared during the November 9, 2012 workshop.

- The proceedings of the abovementioned workshop were documented and the UP Manila Health and Safety Committee compiled the Emergency/Disaster Action Plans submitted by the Colleges and Units.

2013 - A write shop was conducted on October 30, 2013 for the development of the Manual on Disaster Risk Reduction and Management for UP Manila and the Philippine General Hospital.

1.3. Awareness and Disaster Action Planning: A Big Step for Coping with Emergencies and Crisis Situations

Emergencies and crisis situations are likely to occur in an institution like UP Manila due to geographic, structural, socio-economic and environmental vulnerabilities.

It is a common observation that crisis situations occur at a time when people least expect it. Therefore, it is a wise endeavor to enhance the awareness of UP Manila constituents, and institutionalize risk reduction and management programs to minimize the impact of disasters. Such measures are essential so that more lives can be saved and severe damage to properties can be prevented.

UP Manila and UP-PGH constituents who are fully aware of the possible occurrence of crisis situations due to natural and man-made calamities, can have much better chances of coping and adaptation than those who are not aware of the risks.
1.4. Purpose of the Manual

This manual serves as:

- A practical guide to facilitate better planning, implementation and evaluation of programs on disaster risk reduction and management by UP Manila Colleges and Units, including the Philippine General Hospital (PGH) and the National Institutes for Health (NIH).

- A guide for the soon to be organized UP Manila Disaster Risk Reduction and Management Council in compliance with the Philippine Disaster Risk Reduction and Management Act of 2010.

Periodic review and updating of this manual is recommended to make it more responsive to future developments.

1.5. Goals and Objectives

The ultimate goals of the disaster risk reduction and management program to be established soon in UP Manila are:

- To save lives among UP Manila/UP-PGH constituents,
- To prevent massive damage to properties and facilities, and
- To ensure prompt post-disaster recovery and rehabilitation especially in vital areas in the hospital and in the campus.

The objectives are to guide the UP Manila Colleges and Units and the UP-PGH Community in the development of comprehensive strategies for reducing the threats and consequences of calamities or disasters by:

- preventing exposure to hazards (dealing with the hazards)
- reducing vulnerabilities (target groups are the UP Manila and UP-PGH constituents)
- developing response and recovery capacities (target groups are the Response and Recovery Teams and concerned agencies/units)

To achieve the objectives, the following activities are essential:

- Conduct regular seminars and refresher courses for UP Manila/UP-PGH constituents to enhance awareness on disaster risks and on the importance of disaster preparedness
- Conduct regular drills and exercises to improve the capabilities of UP Manila and UP-PGH to respond to emergencies and crisis situations

- Institutionalize measures to improve the capabilities of UP Manila and UP-PGH in post-disaster recovery and rehabilitation

References


4. International Database 2010.Universite catholique de Louvain Brussels-Belgium

5. CRED CRUNCH, Issue No. 23, February 2011


7. UP Manila Health and Safety File of Disaster Action Plans of UP Manila Colleges and Units
Chapter 2: Mandate for the Institution of a Disaster Risk Reduction and Management Program in UP Manila

Written by:

Perla Sarausad-Macaraeg, MD, MSc
Professor
College of Public Health, UP Manila

2.1. Legal Mandate

RA 10121 is an Act strengthening the Philippine Disaster Risk Reduction and Management System.

This Act calls for all government units and institutions to take a more proactive stance in dealing with calamities and disasters by institutionalizing the National Disaster Risk Reduction and Management Plan (NDRRMP), and appropriating funds for its purpose.

The NDRRMP provides for the following:

- the identification of hazards, vulnerabilities and risks to be managed
- disaster risk reduction and management approaches and strategies to be applied in managing said hazards and risks
- agency roles, responsibilities and lines of authority at all government levels
- vertical and horizontal coordination of disaster risk reduction and management in the pre-disaster and post-disaster phases
- budgetary resources to implement the plan

2.2. Technical Definition of Terms Used in the Philippine Disaster Risk Reduction and Management Act of 2010

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihood and services, social and economic disruption, or environmental damage</td>
<td>The probability of harmful consequences, or expected losses (deaths, injuries, damaged properties, livelihood and economic activity disruption or environmental damage) resulting from interactions between natural, or human-induced hazards and vulnerable conditions</td>
</tr>
<tr>
<td><strong>Emergency</strong></td>
<td><strong>Vulnerability</strong></td>
</tr>
<tr>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Unforeseen or sudden occurrence, especially danger, demanding immediate action</td>
<td>The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.</td>
</tr>
<tr>
<td></td>
<td>Vulnerability may arise from various physical, social, economic and environmental factors such as:</td>
</tr>
<tr>
<td></td>
<td>• poor design and construction of buildings</td>
</tr>
<tr>
<td></td>
<td>• inadequate protection of assets</td>
</tr>
<tr>
<td></td>
<td>• lack of public information and awareness</td>
</tr>
<tr>
<td></td>
<td>• limited official recognition of risks and preparedness measures, and</td>
</tr>
<tr>
<td></td>
<td>• disregard for wise environmental management</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Disaster</strong></th>
<th><strong>Disaster Risk</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts which exceeds the ability of the affected community or society to cope using its own resources</td>
<td>The potential disaster losses in lives, health status, livelihood, assets and services, which could occur to a particular community or a society over some specified future time period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Disaster Risk Reduction</strong></th>
<th><strong>Risk Assessment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters. It includes the following:</td>
<td>A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihood and the environment on which they depend.</td>
</tr>
<tr>
<td>• reduced exposure to hazards</td>
<td></td>
</tr>
<tr>
<td>• lessened vulnerability of people and property</td>
<td></td>
</tr>
</tbody>
</table>
• wise management of land and the environment, and
• improved preparedness for adverse events

Risk Assessments with associated risk mapping, include the following:
• a review of the technical characteristics of hazards such as their location, intensity, frequency and probability
• the analysis of exposure and vulnerability including the physical, social, health, economic and environmental dimensions, and
• the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios

<table>
<thead>
<tr>
<th>Disaster Risk Reduction and Management</th>
<th>Disaster Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.</td>
<td>The outright avoidance of adverse impacts of hazards and related disasters.</td>
</tr>
<tr>
<td>Disaster Mitigation</td>
<td>Disaster Preparedness</td>
</tr>
<tr>
<td>The lessening or limitation of the adverse impacts of hazards and</td>
<td>The knowledge and capacities developed by</td>
</tr>
</tbody>
</table>
Mitigation measures include:

- Engineering techniques and hazard resistant construction
- Improved environmental policies and programs
- Public awareness

Preparedness action is carried out within the context of disaster risk reduction and management. It aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery.

Preparedness is based on a sound analysis of disaster risk and good linkages, with early warning systems. It includes such activities as:

- contingency planning
- stockpiling of equipment and supplies
- the development of arrangements for coordination
- evacuation and public information, and
- associated training and field exercises

Preparedness activities must be supported by formal institutional, legal and budgetary capacities.

<table>
<thead>
<tr>
<th>Disaster Response</th>
<th>Post-Disaster Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>The provision of emergency services and public assistance during and immediately after a disaster in order to save lives, reduce health</td>
<td>The restoration and improvement where appropriate, of facilities, livelihood and living conditions of disaster-affected</td>
</tr>
</tbody>
</table>
impacts, ensure public safety and meet the basic subsistence needs of the people affected.

2.3. Simple Definition of Terms as Applied to UP Manila and UP-PGH

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any potential threat to safety &amp;/or health on UP Manila and UP-PGH communities</td>
<td>Anticipated consequences of a specific hazard interacting with UP Manila and UP-PGH (at a specified time)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency</th>
<th>Vulnerabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>An actual threat to safety &amp;/or health on UP Manila and UP-PGH communities</td>
<td>Factors which increase the risks arising from a specific hazard in UP Manila and in PGH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disaster</th>
<th>Capacities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any actual threat to safety &amp;/or health where local government and the emergency services are unable to meet the immediate needs of UP Manila and UP-PGH communities</td>
<td>An assessment of ability to manage an emergency (Total capacity is measured as readiness)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>People, property, services, livelihoods and environment i.e. the elements exposed to hazards</td>
<td></td>
</tr>
</tbody>
</table>

2.4. Recommended Organizational Structure for UP Manila Disaster Risk Reduction and Management

During the Manual Write-Shop conducted by the UP Manila Health and Safety Committee last October 30, 2013, the importance of complying with the provisions of RA 10121 was emphasized by representatives from the National Disaster Risk Reduction and Management Council and other government agencies (e.g. the Bureau of Fire Protection, Manila Police Department, etc.).

The provisions of the abovementioned law calls for the institutionalization of the National Disaster Risk Reduction and Management Plan.

RA 10121 also requires all government units and institutions to provide funds for the abovementioned plan and to organize a Disaster Risk Reduction and Management Council as the policy-making body.

Figure 2.1 below illustrates the recommended organizational structure showing the relationship among various groups responsible for the planning and

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
management of disaster risk reduction programs in UP Manila and UP-PGH. This organizational structure may be modified as deemed fit by the University Administration.

Legend:

* = existing in the organization
** = soon to be organized

Figure 2.1: Recommended Organizational Structure for UP Manila/UP-PGH
Disaster Risk Reduction and Management

The essential components in the organizational structure for disaster risk reduction and management, that should soon be organized and institutionalized in UP Manila and UP-Philippine General Hospital (UP-PGH), are:

• The UP Manila/UP-PGH Disaster Risk Reduction and Management Council (UP Manila/UP-PGH DRRMC),

• The College/Unit Disaster Prevention/Mitigation and Preparedness Teams, and

• The College/Unit Disaster Recovery/Rehabilitation Teams.

2.4.1. The UP Manila/UP-PGH DRRMC, Composition and Responsibilities

To comprise the UP Manila Disaster Risk Reduction and Management Council, are the respective Deans or Directors of UP Manila Colleges and Units or their designated representatives.

The UP Manila/UP-PGH DRRMC shall be headed by a Chair and a Co-Chair to be designated by the UP Manila Chancellor and the PGH Director.

The abovementioned Council shall:

• Review and update policies and guidelines in order to institutionalize and strengthen the respective Disaster Risk Reduction and Management Plans of the Colleges and Units

2.4.2. The UP Manila/UP-PGH Health and Safety shall:

• Oversee the planning, implementation and evaluation of campus-wide &/or hospital-wide projects for disaster prevention, mitigation, and preparedness, for disaster response and for post-disaster recovery and rehabilitation

• Review the annual accomplishment reports submitted by Colleges and Units and recommend appropriate actions

2.4.3. The College/Unit Disaster Management Teams, Duties and Responsibilities

At the frontline in the disaster risk reduction and management organizational structure are:

• The College/Unit Disaster Prevention/Mitigation and Preparedness Teams,
• The College/Unit Emergency Response Teams (ERTs), and
• The College/Unit Disaster Recovery/ Rehabilitation Teams

These teams have key roles in the implementation of disaster risk reduction and management plans of their respective institutions/units.

The recommended duties and responsibilities of the Disaster Prevention/ Mitigation and Preparedness Teams are illustrated in Figures 2.1.1 and 2.1.2 in Appendix 2.1.

Figure 2.1.3 in Appendix 2.1 illustrates the recommended duties and responsibilities of the Disaster Recovery and Rehabilitation Teams.

The roles and responsibilities of the Emergency Response Team members are described in detail in Chapter 4 of this Manual.

Reference
1. RA 10121, The Philippine Disaster Risk Reduction and Management Act of 2010
Appendix 2.1
Duties and Responsibilities of the Different Teams for Disaster Risk Reduction and Management

Figure 2.1.1: Flow Chart of Activities, College/Unit Disaster Prevention/Mitigation and Preparedness Team
Assess the level of awareness and capabilities of their College or Unit to effectively anticipate, respond to, and recover from the impact of disasters.

Develop a Disaster Preparedness and Contingency Action Plan for the College or Unit.

Increase the awareness among constituents regarding:
- Risk to various hazards
- Impact of various hazards
- Evacuation Routes
- Evacuation sites
- Coding system for disasters

Conduct evacuation drills every semester.

Facilitate the provision of the following:
- Early warning system for various types of disaster
- Fast and dependable communication system

Store or stockpile necessary equipment and basic supplies to sustain people at the evacuation site during disasters.

Request budget allocation for the implementation of projects for disaster preparedness.

Coordinate with other Colleges or Units as needed to facilitate sharing of resources.

Submit annual accomplishment reports to UPM-PGH DRRMC.

Recommend appropriate measures to improve disaster preparedness in the College or Unit.

Figure 2.1.2: Flow Chart of Activities, College/Unit Disaster Prevention/Mitigation and Preparedness Team (Continued)
Figure 2.1.3: Flow Chart of Activities, College/ Unit Disaster Recovery and Rehabilitation Team

1. Assess the extent of damage to properties and facilities after a disaster
2. Identify Priority Areas needing immediate recovery/rehabilitation
3. Develop Action Plans for immediate and for long term recovery of affected areas
4. Conduct orientation/training of team members on:
   - Damage Assessment
   - Risk Assessment
   - Proper Techniques for Recovery/Rehabilitation of equipment and facilities
5. Facilitate return of operations in vital areas especially in a hospital like the PGH, where heavy influx of disaster victims are expected
6. Estimate the following:
   - Damage costs
   - Recovery/Rehabilitation costs, etc.
7. Coordinate with government and non-government organizations for immediate restoration of vital facilities and services
8. Request appropriate funding for long term recovery projects for affected areas
9. Monitor recovery procedures and recommend measures, as needed, to improve said procedures
10. Submit accomplishment reports regularly to the UP Manila/UP-PGHDRRMC
Chapter 3: Process Model for UP Manila Disaster Risk Reduction Planning and Management

Written by:

Perla Sarusad-Macaraeg, MD, MSc
Professor
College of Public Health, UP Manila

Programs for Disaster Risk Reduction and Management should include systematic plans of action to be implemented before, during and after the occurrence of calamities.

Before the occurrence of any disaster or calamity, Risk Assessment, Preparedness and Mitigation Plans should be implemented in UP Manila and UP-PGH communities, in coordination with concerned Government Agencies such as the Bureau of Fire Protection, PHIVOLCS and other concerned office or unit.

Furthermore, an Internal Disaster Response Plan should be in place in UP Manila and UP-PGH, to be activated during and immediately after disasters. When chaos and devastation of a disaster demand capabilities beyond those which UP Manila and UP-PGH can afford, Local Government Units(LGUs) and the National Government are supposed to respond. Designated College/Unit Disaster Response Teams and volunteers may also help.

Recovery and Rehabilitation Plans are activated after disasters, in coordination with the LGUs and concerned Government Organizations/Agencies

Figure 3.1 below illustrates the flow in the Disaster Management Cycle:

Figure 3.1: The Disaster Management Cycle and its Component Stages
### Steps in the Process Model for Disaster Risk Reduction Planning and Management in UP Manila

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Disaster Risk and Hazard Assessment by UP Manila Colleges and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The important components of this strategy are the identification of various safety hazards, the mapping of vulnerable areas and the identification of the high risk population.</td>
</tr>
<tr>
<td></td>
<td>Ideally, assessment of various safety hazards should be done every year by UP Manila Colleges and Units. This is to facilitate proper evaluation and ensure appropriate implementation of preventive and control measures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>Formulation of Disaster Risk Reduction and Management Plans by UP Manila Colleges and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UP Manila Colleges and Units are encouraged to develop their own action plans based on the assessment of their respective vulnerabilities and risks to various types of hazards.</td>
</tr>
<tr>
<td></td>
<td>The Risk Reduction and Management Plan includes:</td>
</tr>
<tr>
<td></td>
<td>1. An Emergency Preparedness Program</td>
</tr>
<tr>
<td></td>
<td>• Hazard Reduction/Prevention Program</td>
</tr>
<tr>
<td></td>
<td>• Vulnerability Reduction Program</td>
</tr>
<tr>
<td></td>
<td>• Emergency Preparedness Program</td>
</tr>
<tr>
<td></td>
<td>2. An Emergency Response Plan</td>
</tr>
<tr>
<td></td>
<td>• Contingency Plan</td>
</tr>
<tr>
<td></td>
<td>• Business Continuity Plan</td>
</tr>
<tr>
<td></td>
<td>3. An Emergency Recovery and Rehabilitation Plan</td>
</tr>
<tr>
<td></td>
<td>Emergency and Disaster Action Plans shall be updated every 1-3 years. (See Appendix 3.1 for the recommended Template of an Emergency Preparedness, Response and Recovery Plan).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3</th>
<th>The UP Manila Disaster Action Plan Workshop</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This activity enables the various colleges and units of UP Manila to share their respective disaster action plans. The workshop also facilitates proper coordination and cooperation among UP Manila constituents especially during crisis situations.</td>
</tr>
<tr>
<td>Step 4</td>
<td><strong>Organization and Mobilization of Various Technical Working Groups (TWG's) for the Development/Updating of the Manual</strong></td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Technical Working Groups are tasked to develop technically sound and practical guidelines for dealing with various types of emergencies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 5</th>
<th><strong>Presentation of the Manual Draft to the UP Manila Health &amp; Safety Committee and to Concerned Agencies for Internal and External Review</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To ensure that the guidelines incorporated in the Manual are suitable for UP Manila and UP-PGH, a review should be conducted by the UP Manila/UP-PGH Health and Safety Committee headed by the Vice Chancellor for Administration. Copies of the Manual draft shall also be presented to appropriate government agencies for review. This is to ensure that our strategies and action plans for disaster management are aligned with the government plan.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 6</th>
<th><strong>Write-shop for the Development of a UP Manila Manual for Disaster Risk Reduction and Management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The write-shop facilitated by a faculty of the National Teachers’ Training Center for Health Professionals (NTTC-HP), UP Manila, shall be conducted to ensure the worthiness of the Manual, both in substance and in form. Representatives from concerned government agencies( NDRRMC, BFP, PHIVOLCS, PNP, etc.) shall be asked to make their recommendations to ensure that our policies and strategies are aligned with government plans and strategies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 7</th>
<th><strong>Approval by the Office of the Chancellor, UP Manila</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To institutionalize the provisions indicated in this Manual, approval by the UP Manila Chancellor is required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 8</th>
<th><strong>Dissemination of Manual to All UP Manila Colleges and Units</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Office of the Vice Chancellor for Administration shall facilitate the publication and dissemination of the approved Manual to all UP Manila constituents</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 9</th>
<th><strong>Monitoring and Evaluation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The UP Manila/UP-PGH Health and Safety Committee shall monitor the implementation of the respective emergency/disaster risk reduction and management projects by various UP Manila</td>
</tr>
</tbody>
</table>
Colleges or Units.

Accomplishment reports from Colleges and Units shall be reviewed at least once a year.

Monitoring efforts shall establish whether or not action plans are duly implemented.

Evaluation results and recommendations shall be submitted to the UP Manila/UP-PGH Disaster Risk Reduction and Management Council to facilitate updating of policies and guidelines for disaster risk reduction and management.

Evaluation of disaster risk reduction and management programs should be done regularly every 1-3 years, by the UP Manila/UP-PGH Disaster Risk Reduction and Management Council.

After monitoring and evaluation, **Step 1 (Disaster Risk and Hazard Assessment)** shall be done again and another cycle is started. (See Figure 3.1)

Note that the arrows in the cycle are directed in two ways. It tells us that one can go one step or more backward or forward in the cycle.

This process model allows necessary modifications in the planning and management of disaster risk reduction programs as called for by the situation.

Figure 3.1 below shows the process flow for the planning and management of disaster risk reduction programs at UP Manila:
Figure 3.1: Process Model for Disaster Risk Reduction Planning and Management in UP Manila
Reference


APPENDIX 3.1

TEMPLATE FOR HEALTH EMERGENCY PREPAREDNESS, RESPONSE AND RECOVERY PLAN (HEPRRP)

I. Background
II. Plan Description/Definition
III. Goals and Objectives
IV. Planning Group
V. Risk Reduction Plan
   • Hazards prevention
   • Vulnerabilities reduction
   • Emergency Preparedness Plan
VI. Management Structures
VII. Roles and Responsibilities
VIII. Emergency Response Plan
   • Policies, guidelines, protocols for the developed Systems
   • Plan of action on the first 2 hours, 2 to 12 hours, and after 24 hours from the time of the emergency
IX. Recovery and Reconstruction Plan
X. Annexes
   • Glossary
   • Abbreviations
   • Hazard Maps
   • Flow Charts
   • Directory of Contact Persons
   • Inventory of Resources or Assets of Hospital and Partner Agencies
   • Regional/Office Orders for Health Emergency Management
Chapter 4: The Incident Command System of UP Manila

Written by:
Perla Sarausad-Macaraeg, MD, MSc
Professor
College of Public Health, UP Manila
Fevito A. Obidos, Jr.
University Researcher
College of Medicine, UP Manila

In times of calamities and disasters, timely decisions and prompt response by the Emergency Response Teams (ERTs) can save several lives and lessen the number of the injured among UP Manila constituents.

Coordination among the ERTs is also of utmost importance in order to minimize panic and chaos; thus, the presence of a decisive leader can be of great advantage.

Figure 4.1 below presents an algorithm which aims to guide UP Manila constituents in identifying who will be in command during emergency situations.

Figure 4.1: Algorithm for Identifying Who is the Incident Commander
Responses to emergency situations localized only in one (1) UP Manila College/Unit are to be handled by the Emergency Response Teams of the concerned College or Unit. In this case, the Dean or Unit Head shall oversee the operations of the College or Unit emergency response team (ERT).

During emergencies which affect two (2) or more Colleges or Units, a number-coded “call out” shall be made to activate the Incident Command System of the UP Manila campus (See Table 4.2).

Activation of the Incident Command System, shall mean that the UP Manila Central Administration, headed by the Chancellor or his designated representative, shall directly take charge in the operations of all the ERTs. When the Incident Command System (ICS) is summoned, all ERT Marshalls should report immediately to the UP Manila Chancellor.

Crisis situations affecting the Philippine General Hospital shall activate the Hospital Incident Command System headed by the PGH Director.

4.1. Incident Command System (ICS): Composition and Scope of Responsibilities

To maintain control and rapidly organize the many different departments and groups in the University during critical situations, an incident command system shall be activated.

The critical incident command system can only be activated by the ERT Marshall, the Department Chair, the College Dean or Unit Director and the University Chancellor.

In crisis situations wherein none of the abovementioned officials are present, command responsibility shall be on the highest university official who is in the area.

As soon as a “Call Out” is made and the ICS is activated, the Emergency Response Teams (ERTs) have to be informed immediately.

Standby alert for members of the ICS is to be ensured 24/7 and they should start working in 5 minutes after an emergency call.
The basic composition of the Incident Command System are shown in Figure 4.1 below:

![Diagram of the Incident Command System](image)

**Figure 4.1: Composition of the Incident Command System (ICS)**

The Marshall, College Dean, Unit Director or Chancellor shall decide where the Incident Command Post should be established. There shall be 2 locations within the university and 1 away from the university which shall be prepared to meet the needs of the ICS considering availability of the following:

- handbooks
- space
- maps
- electronic devices
- telephone and internet lines
- monitors
- TV screens

**Incident Command System Responsibilities:**

1. **The Incident Commander**

   - Can be the Marshall, Dean or Chancellor
   - Is responsible for all aspects of the response
   - Develops the Incident Objective, manages all incident operations, and delegates specific tasks and responsibilities to subordinates
- Communicates with top managers and politicians outside the university for proper coordination.

2. Fire Fighting Team

- Is responsible for extinguishing building and equipment fire

- Members report to their team leader who in turn reports to the Incident Commander

- Team should always position themselves with an exit or means of escape at their back before attempting to use an extinguisher to put out a fire.

3. Evacuation Team

- Responsible for evacuating building occupants in a safe, orderly and efficient manner

- Ensure that everyone has evacuated the building

- Direct everyone to the evacuation area (See APPENDIX 4.1) wherein a complete head count shall be done to ensure that everyone is accounted for

- Report to the Evacuation Team Leader who in turn relays information to the Incident Commander (IC).

4. Search and Rescue (SAR) Team

- Responsible for post-evacuation search and rescue in a planned and coordinated manner in areas still considered safe

- Reports to their team leaders who in turn reports to the Incident Commander

5. Medical Team

- Responsible to managing physical, mental and emotional problems among victims brought about by the crisis

- Establish a medical treatment area

- Communicate and work with PGH Emergency Medical Service.
6. Communications Team

- Responsible for internal and external communications
- Reports to their Team Leader who in turn reports to the Incident Commander

Information Needed in Transmitting an Emergency Alarm:

a. Kind of Emergency
b. Location of Emergency
c. Name of Caller
d. Return number

7. Public Information Officer (Media Handler)

- Responsible for releasing information to the media
- Reports to the Incident Commander (IC).

4.2. The Emergency Response Teams (ERTs): Composition, Specific Duties and Responsibilities

4.2.1. ERT Composition

Since year 2009, UP Manila has endeavored to orient and train ERT members from various Colleges and Units who shall be tasked to respond to all types of emergencies.

All UP Manila Colleges and Units shall have designated basic personnel for the ERT, to take charge of Communications, Evacuation, Fire Fighting, Rescue and Salvage, First Aid/Medical Service, Security, Logistics and others.

Fire drills have been conducted among UP Manila Colleges and Units. Aside from fire drills, earthquake drills and other types of emergency drills shall have to be conducted regularly at least twice in an academic year.

Figure 4.2 below shows the basic components of the ERT as recommended by the Bureau of Fire Protection. Additional components may be included in the ERT upon the discretion of each UP Manila College or Unit.
4.2.2. Emergency Response Team: Specific Duties and Responsibilities

It is of utmost importance that all members of the Emergency Response Teams are fully aware of their duties and responsibilities and are committed to perform them.

ERT Members must also be duly trained and equipped to enable them to perform their duties effectively.

ERT members duly assigned during the Fire Drills conducted at UP Manila, shall also assume the same responsibilities in the occurrence of other types of emergencies.

Listed below are the members of the ERT and their duties and responsibilities as recommended by the Bureau of Fire Protection:
4.2.2.1 ERT Officers

**ERT Marshal**

- Organize develop and implement the safety plan
- Assist the Administration in organizing, training and managing the ERT
- Provide equipment, tools, appliances and other supplies for ERT use
- Conduct evacuation/fire exit drills
- Supervise and coordinate the ERT personnel during actual fires, fire drill and other emergencies
- Implement periodic inspections of firefighting equipment to assure the ERT is adequately equipped
- Conduct periodic safety inspection of the campus premises and properties

**Deputy ERT Marshal**

- Assist the ERT marshal in all activities of the brigade
- Assume the duties and responsibilities of the ERT marshal during his absence of incapacity to perform duties

**Head, Communication Team**

- Promptly notify the ERT Marshal and Fire Department of any incidence if fire or other emergencies
- Receive and transmit messages, orders and related information during the period of emergency or during fire drills
- Supervise and direct command post and traffic personnel during emergency
- Use available communication facilities such as inter-department telephone and public address system and hand-held or portable radios
**Head, Evacuation Team**

- Assist the Administration in organizing and training the evacuation teams
- Assign floor wardens, exit guides and searchers to each floor, zone area
- Supervise and coordinate the evacuation team members during emergencies and during emergency drills

**Head, Fire Extinguishing Team**

- Assist in organizing the fire extinguishing teams and the rescue and salvage teams
- Supervise and coordinate the teams in the control and extinguishment of fires and in rescue and salvage operations
- Assist the fire department personnel during fire operations
- Assume the responsibility for the availability and readiness of Firefighting teams

**Floor Wardens**

- Supervise the evacuation of occupants in his assigned area
- Monitor the progress of the evacuation and act in accordance with the evacuation plan
- Clear the floor area assigned to him, of all occupants before leaving
- Conduct a head count to assure that all regular occupants known to have occupied the floor area have been evacuated

**Head, Fire extinguisher and Fire Hose Team**

- Supervise their respective teams in the control and extinguishment of fire in times of emergency and during simulated fire situations

**Head, Rescue and Evacuation Team**

- Supervise the team members in rescue and salvage operations
- Perform other tasks on order
**Traffic Officer**

- Supervise the Security Team in clearing the emergency area of obstructions
- Secure the emergency area and all other areas within the campus

**Medical Officer/Head, First Aid Team**

- Supervise the first aid team in the temporary treatment of victims
- Provide for a first aid site or center
- Send victims or injured persons to the nearest hospital or medical hospital or medical clinic when necessary

**4.2.2.2. ERT Members**

**Telephone Operator/Communication Personnel**

- Promptly notify the fire department of any incident of fire when ordered by an authorized officer
- Receive and transmit messages, orders and important information when so ordered

**Security Team Members**

- Clear the street and passageways for the eventual use of evacuating occupants and personnel
- Clear the lanes of parked vehicles and other obstructions for the easy access of the fire department apparatus and other emergency vehicles
- Isolate and secure the emergency area and other important areas, allow only emergency vehicles and authorized persons in the area.
- Perform other tasks
First Aid Team Members and Driver of Emergency Vehicles

• Administer first aid treatment to victims/injured persons

• Transport and accompany the victim to the nearest hospital or medical clinic when so ordered

Rescue Team Members

• Conduct rescue operations under the supervision of their Head

• Transport victims to the first aid station/center for check-up and/or proper treatment

Salvage Team Members

• Conduct salvage operations

• Evacuate the building or area of its valuable contents using the following order of property:
  1. Priority 1 – classified records, data, information, maps and valuable equipment’s
  2. Priority 2 – records other classified
  3. Priority 3 – supplies and materials
  4. Priority 4 – office furniture and other less important supplies and materials

Exit Guides

• Acquaint Evacuation Team of the floor plan of the building or area as to the evacuation routes and location of exits

• Guide the occupants of the building or area to the safe exits and lead them to the pre-designated assembly area

• Assist floor warden in supervising the evacuation in order to achieve an orderly evacuation under proper discipline
• Prevent panic, confusion, injury and loss of life during fire emergency or fire drills

**Searchers (Male and Female)**

• Search the area or rooms especially the comfort rooms for persons who may be trapped or unaware of the emergency or drill
• Report the particulars to the floor warden after having searched the area thoroughly

**Fire Extinguishing Team Members**

• Control and extinguish fires under the supervision of their respective leader
• Know how to handle and operate firefighting tools, appliances and equipment available in the plant, know the location of these tools and equipment
• Familiarize themselves of the specific uses of the different types of portable fire extinguishers relative to the classes of fires
• Familiarize themselves with general structure of the building and its premises

**4.3. Color Coding for the Identification of ERT members**

    The UP Manila Health and Safety Committee has agreed to utilize color-coded armbands for proper identification of various ERT members.

    The color-coded armbands shall be used during emergency drills and during real emergency situations, in order to facilitate better coordination among ERT personnel.
Table 4.1 below shows the color assignment for different members of the ERT:

Table 4.1: ERT COLOR CODING

<table>
<thead>
<tr>
<th>Role</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Marshall</td>
<td>WHITE</td>
</tr>
<tr>
<td>Deputy Emergency Marshall</td>
<td>WHITE</td>
</tr>
<tr>
<td>Media Handler</td>
<td>PINK</td>
</tr>
<tr>
<td>Communication Team</td>
<td>MAROON</td>
</tr>
<tr>
<td>First Responder (Fire Fighter Team)</td>
<td>RED</td>
</tr>
<tr>
<td>Evacuation Team</td>
<td>BLUE</td>
</tr>
<tr>
<td>Salvage Team</td>
<td>ORANGE</td>
</tr>
<tr>
<td>Search and Rescue Team</td>
<td>ORANGE</td>
</tr>
<tr>
<td>First Aid Team</td>
<td>GREEN</td>
</tr>
<tr>
<td>Logistic Team</td>
<td>YELLOW</td>
</tr>
<tr>
<td>Transport Team</td>
<td>VIOLET</td>
</tr>
<tr>
<td>Security Team</td>
<td>GRAY</td>
</tr>
</tbody>
</table>

4.4. Coding According to Type of Emergency or Disaster

Various types of emergencies or disasters shall be coded according to the coding system being utilized by the UP-Philippine General Hospital.

Using the same code shall ensure better cooperation and coordination between UP Manila and the Philippine General Hospital especially during crisis situations.

Table 4.2 below shows the recommended code designations for various types of emergencies.
Table 4.2: UP-PGH Emergency Code Nomenclature Adopted by UP Manila

<table>
<thead>
<tr>
<th>Code of Events</th>
<th>Recommended Code Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac Arrest</td>
<td>Code “1”</td>
</tr>
<tr>
<td>Fire</td>
<td>Code “2”</td>
</tr>
<tr>
<td>Security /Explosive-Related Emergencies</td>
<td>Code “3”</td>
</tr>
<tr>
<td>Hazardous Material Release</td>
<td>Code “4”</td>
</tr>
<tr>
<td>Disaster Plan Activation</td>
<td>Code Triage</td>
</tr>
<tr>
<td>Trauma Patient/Arrival Trauma Team Activation</td>
<td>“Code Triage-Standby”</td>
</tr>
<tr>
<td></td>
<td>“Code Triage”</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Code “5”</td>
</tr>
<tr>
<td>External Mobilization</td>
<td>Code “6”</td>
</tr>
<tr>
<td>Flood and Typhoons</td>
<td>Code “7”</td>
</tr>
<tr>
<td>Biological Hazards</td>
<td>Code “8”</td>
</tr>
<tr>
<td></td>
<td>Code “9”</td>
</tr>
</tbody>
</table>

References


2. RA 9514 Rule 6 of the Bureau of Fire Protection

3. Basic Evaluation and Treatment in Trauma Emergencies BETTER 2010; Philippine College of Surgeons.

APPENDIX 4.1 EVACUATION AREAS, UP MANILA/UP-PGH

APPENDIX 4.1:
UP MANILA / UP-PGH GENERAL EVACUATION AREAS (EXCEPT FOR FLOODS)

LEGEND:
GREEN COLOR
EVACUATION AREAS

CAD BY: ALFREDO Y. BRIONES
Chapter 5: Guidelines for Fire Emergency and Disaster Management at UP Manila

Written by:

Carlos Primero D. Gundran, MD, FPCEM
EMS and Disaster Management Coordinator, DEM UP-PGH

Insp. Generoso Macatangay Juico,
Substation Commander Arroceros Fire Station

Ricardo Poblete
OETS UP-PGH

5.1. Rationale

The goal in emergency and crisis management caused by fire is to minimize the impact and damage to the UP Manila community.

Integral for the realization of this goal are proper coordination, cooperation and communication among various teams. In order to achieve our goal, we need to have individual personnel and teams who are knowledgeable, trained and skilled in dealing with fire-related emergencies and crisis situations.

To effectively implement measures for the prevention and mitigation of fire-related emergencies, we need to have a written plan and guidelines which every UP Manila constituent should know and be familiar with.

This chapter presents strategies and measures for prevention, preparedness, response and recovery for fire-related emergencies and disasters.

5.2. Management of Fire-Related Emergencies and Disasters

5.2.1. Fire Prevention

5.2.1.1. Objectives
   5.2.1.1.1. To prevent Fire from starting
   5.2.1.1.2. To eliminate the cause/s of fire
   5.2.1.1.3. To save lives and property
   5.2.1.1.4. To minimize losses if fire does occur
   5.2.1.1.5. To confine fire in its point of origin
   5.2.1.1.6. To put out fire

5.2.1.2. Principles of Fire Prevention and Control
5.2.1.2.1. Prevent the outbreak of Fire
5.2.1.2.2. Provide for Early Detection

5.2.1.2.2.1. Alarms
   a. Automatic alarm system to sense fire or smoke
      • Smoke detectors
      • Heat detectors
      • Light radiation/Flame Detectors
   b. Manually operated alarm system shall be located within 61 meters travel distance from any point of the building, to warn occupants of the building of incipient fire.

5.2.1.2.3. Prevent the Spread of Fire by the use of barriers to limit the area of a fire or retard the spread of fire.
   a. Fire Wall
   b. Fire Doors
   c. Shutters or louvers
   d. Baffles
   e. Fire Dampers
   f. Dikes

5.2.1.2.4. Provide for Prompt Extinguishment
   5.2.1.2.4.1. Blanketing or Smothering
   5.2.1.2.4.2. Cooling or quenching
   5.2.1.2.4.3. Removal of fuel
   5.2.1.2.4.4. Fire Extinguishers
      a. Permanent or Built-in Extinguishers
         • Standpipe and hose
         • Sprinkler system
         • Automatic extinguishing system
      b. Portable Extinguishers (should be accessibly located and maintained in operating condition)
         Types:
         • Dry Chemical (Red)
         • HCFC 123 (Green)
         • Aqueous Film Forming Foam (AFFF) (Blue)

5.2.1.2.4. Provide for Prompt and Orderly Evacuation

5.2.1.2.4.1. Exit Safely
   a. At least 2 ways out and remote from each other.
b. Know your emergency exits

5.2.1.2.4.2 Travel distance to exits should be 45 m, if area is without sprinkler and 60 m, if with sprinkler.

5.2.1.2.4.3. Signs should be readily visible and placed within 30m from exit access

5.2.1.2.4.4. Emergency lights should provide illumination for at least 1.5 hour

5.2.2. Fire Preparedness ¹

Awareness of the presence of fire hazards and the capability of UP Manila constituents to implement a systematic plan of action for the prevention and mitigation of the effects of fire, enhances the preparedness of the institution and improves its capability to deal with emergency situations due to fire.

5.2.2.1. Written Plan

This manual should be made available in all libraries and in every classroom and offices in UP Manila for everyone to read and study if they wish to. A PDF copy will also be made available for downloading in the UP Manila website.

5.2.2.2. Trainings

Regular trainings and orientations will be conducted for students and staff prior to fire drills in coordination with the Bureau of Fire Protection (BFP):

5.2.2.2.1. Fire Prevention, Disaster Preparedness, Firefighting

- Proper Evacuation Procedures
- Proper Search and Rescue (SAR) procedures
- Incident Command System (ICS)

5.2.2.2.2. First Aid and Basic Life Support (BLS) in coordination with Department of Emergency Medicine (DEM), UP-PGH.
5.2.2.3. Regular Inspection

A quick check that visually determines whether the fire extinguisher and other firefighting equipment are properly placed and will operate effectively when needed. This should be done regularly by the Building Safety Officer.

5.2.2.4. Drills

As required by the Bureau of Fire Protection, a Fire Drill must be held at least twice a year and within the first month of starting classes.

Table 5.1 Time Flow of Response in a Fire Drill

<table>
<thead>
<tr>
<th>TIME</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>Usual College Activity</td>
</tr>
<tr>
<td>00:00</td>
<td>Smoke/Fire was noticed in the area</td>
</tr>
<tr>
<td>00:01</td>
<td>Necessary steps</td>
</tr>
<tr>
<td>00:02</td>
<td>Staff notify front desk/secretariat of the smoke/possible fire.</td>
</tr>
<tr>
<td></td>
<td>Secretary notifies College Communications Staff Officer/Security and sends a team to investigate the source of smoke.</td>
</tr>
<tr>
<td></td>
<td>Security notifies operator if not yet notified</td>
</tr>
<tr>
<td></td>
<td>Communication Team awaits assessment of affected area and notifies proper authorities (UP Manila/Fire/Police/EMS etc)</td>
</tr>
<tr>
<td>00:03</td>
<td>In the event of an uncontrolled fire… Emergency Response Marshall/ Floor Team Leader assumes command of situation.</td>
</tr>
<tr>
<td></td>
<td>Necessary steps</td>
</tr>
<tr>
<td></td>
<td>Activate the Crisis Plan: Fire and Evacuation.</td>
</tr>
<tr>
<td></td>
<td>Inform Communications Officer.</td>
</tr>
<tr>
<td></td>
<td>Alert System announced to the Public Address System.</td>
</tr>
<tr>
<td></td>
<td>Fire Fighting Team attempts to control fire with extinguishers or hose.</td>
</tr>
<tr>
<td></td>
<td>Decision to evacuate the floors if situation is still uncontrolled.</td>
</tr>
<tr>
<td></td>
<td>Evacuation Team takes charge of evacuating their floor</td>
</tr>
<tr>
<td></td>
<td>Evacuation starts in involved Floor. Horizontal evacuation first then vertical evacuation if necessary.</td>
</tr>
<tr>
<td></td>
<td>Incident Command Post identified. Incident Commander and Officers meet here.</td>
</tr>
<tr>
<td></td>
<td>Emergency Medical Service(EMS) reports to Incident Commander( IC) and sets-up the Treatment Area.</td>
</tr>
<tr>
<td></td>
<td>Security Team promotes 1-way traffic throughout the Compound and secures Incident Command Post(ICP) and Treatment Area(TA).</td>
</tr>
</tbody>
</table>
5.2.3. Responses to Fire-Related Emergencies and Disaster

5.2.3.1. Alert Phase

For timely alert, everyone is obliged to issue immediately fire alarm if a fire or explosion is observed.

5.2.3.1.1. Aims

5.2.3.1.1.1. To protect students, staff from injury and minimize damage to equipment
5.2.3.1.1.2. To minimize damage to the University properties
5.2.3.1.1.3. For the Emergency Response Team(ERT) to stay as functional as possible during the incident.

5.2.3.1.2. Levels of Emergency Responses:

5.2.3.1.2.1. Alert

-Period when it is believed that resources
may be required to enable an increased level of response

5.2.3.1.2.2. Stand By
- Period following alert wherein controlling organization believes that the deployment of resources is imminent.

5.2.3.1.2.3. Call-Out
- The command to deploy resources. For Fire, callout shall be “CODE 2”. In case there is no Public Address (PA) System, a single continuous fire alarm is sounded. In cases when both is not available a megaphone or someone calling for everyone to organize and evacuate shall be done by the Evacuation Teams.

What to Do when there is Fire in your Building:

- Follow evacuation routes
- Use stairways, not elevators
- Walk, do not run
- Stay close to the floor where there is air
- Test doors with the back of the hand for presence of heat
- Close the door behind you.

5.2.3.1.2.4. Stand Down
- Period wherein the emergency is controlled and resources may be recalled.

5.2.3.2. WISC/ ICC Procedures for Emergencies due to Fire

- Guide for Students/Staff:
  The following steps have to be initiated:

  1. WARN- persons in danger
  2. INFORM- other students and staff (dial UP Manila Operator or Security Office)
  3. START FOR SAFETY- start extinguishing fire or start evacuation
  4. CONTINUE- if no additional help can be offered or ordered, continue with respective responsibilities

- Guide for Members of the Emergency Response Team (ERT):

  1. INFORM- the ERT and the Marshall.
2. CONTINUE- with the evacuation if possible. Start with head count in the Evacuation Site. Activate the SAR and First Aid Team if necessary.

3. COMMUNICATE- with each other, especially with the Incident Commander and Fire Brigade concerning information of possibly trapped victims and special needs of patients.

- ERT Marshall
  - Shall decide if he has to summon the Incident Command System (ICS) and will stay in contact with the Fire Brigade.

5.2.3.3. Evacuation Procedures

Some special crisis situations, (such as fires after a strong earthquake) are threats to part of the university or to the whole university itself. In these situations it is necessary to evacuate the buildings.

- The fastest possible evacuation has to be conducted if a planned evacuation poses increased risk to people. Evacuation time should be 1 minute per floor. Usually the Incident Commander or ERT Marshall decides about the evacuation.

In case of immediate danger, the staff on site is responsible for starting the evacuation. If there will be casualties who need to be transported to hospitals, the Incident Command System will facilitate the transportation with the aid of the PGH-Emergency Medical Service.

WHAT TO DO IN SITUATIONS NEEDING FAST EVACUATION

- In case of fire, no elevators must be used

- All students, staff and guests will be immediately evacuated to PGH Oblation Plaza

- Teachers in classrooms shall be responsible for their students.
  - They have to know how many students are present and if all are accounted for.

  - Each teacher shall coordinate the accounting of their individual classes and report to the Evacuation Team Leader.
5.2.3. **Recovery and Rehabilitation After Fire-Related Emergencies and Disaster**

Activities aimed at returning the university back to normal operations will start after the emergency situation due to fire has been controlled and damage assessment has been made.

The procedures presented below which are adapted from the Disaster Plan Workbook, will serve as guide for Recovery efforts after a fire emergency:

After damage assessment, the Emergency Response Team will return to the designated Incident Command Post and help plan a salvage operation for damaged materials with the Recovery Team.

Based on information recorded in disaster recovery charts completed during the site visit of affected areas, the soon to be organized UP Manila-PGH Disaster Risk Reduction and Management Council shall:

- Establish priorities.
- Develop and assign teams for affected areas, using the appropriate names and telephone as well as the volunteer names and telephone numbers listed in a separate directory.
- Assemble supplies from UP Manila and from concerned government agencies.
- Develop a schedule for implementation.
- Define reporting mechanism and communication lines, including an established chain of command for recovery operations. This should include a method to deal with unforeseen modifications that need to be made during the recovery operation.

The Head of the Recovery Team shall appoint an assistant to take minutes during all meetings, request for supplies and other necessities, organize deliveries of supplies, answer telephones, and assist in the management of the recovery process from the Incident Command Post, as needed.

Recovery procedures for various Library materials are indicated in Appendices 5.1 to 5.3. The Collection Priorities for Recovery after Fire Emergency is presented in Appendix 5.4.

In the event of a major disaster, the UP Manila Central Administration will direct a recovery operation using the procedures indicated in the abovementioned appendices.

Minor emergencies where fewer than 1,000 Library materials are affected, should be reported to College Dean or Unit Head. The College Dean and/or the Chair of the UP Manila Disaster Risk Reduction and Management Council shall provide assistance in properly following the instructions in the recovery procedures.
References

1. RA 9514, Rule 6, Bureau of Fire Protection
2. Emergency and Disaster Plan 2011; Thomas Braun et al. based on Krankenhausalarm Planung by Detlef Cwojdinski
3. Basic Evaluation and Treatment in Trauma Emergencies BETTER 2010; Philippine College of Surgeons
6. Disaster Plan Workbook
APPENDIX 5.1

RECOVERY PROCEDURES FOR DAMP BOOKS AND MINOR EMERGENCIES

DAMP BOOKS are defined as books that are not dripping water. They can be wet around the edges or wet half-way through or just cool to the touch. These materials can be AIR DRIED.

CAUTION:

• All air drying MUST take place in a cool, dry place. Warm humid air encourages mold and mildew growth which can be more damaging than the original emergency. Try to keep the temperature below 70 Fahrenheit and the relative humidity below 55%. Use fans and dehumidifiers if needed. Keep the air in the area circulating.
• Keep the drying area clean by removing wet debris such as wet carpeting and furniture as soon as possible because they contribute to a humid environment.
• Never try to reshape or force damp volumes open as this will cause harmful distortion. They can be treated AFTER drying.
• Sponge off mud and debris using clean water but ONLY if material does not have water soluble components such as watercolors, runny inks, tempera and dyes. Instead, air dry materials and brush off debris when completely dry.
• Minimize handling of water damaged books. Paper and bindings are very fragile when wet.

PROCEDURES:

If books can be dried in immediate area, see #8 and #9 below for air drying instructions.

If books must be packed up and moved to drying area:

1. Keep a written record of what volumes are in which box (by floor, range number and call number) and remember to clearly label each box.

2. Use 1 and 1 cubic foot, 200 test lb. cardboard boxes to pack-out and transfer damp books to the drying area. A one cubic foot box will hold about 15 volumes and weighs about 50 pounds when loaded.

3. Wrap each book in one piece of unprinted newsprint; this will prevent colors bleeding into one another. Precut sizes to save time.

4. Pack books SPINE SIDE DOWN IN A SINGLE ROW ON THE BOTTOM OF THE BOX. THIS ARRANGEMENT IS VERY IMPORTANT! DO NOT STACK BOOKS OR OTHER MATERIALS ON TOP. WATER DAMAGED
MATERIALS WILL SAG AND DISTORT ESPECIALLY UNDER PRESSURE, CAUSING PERMANENT DEFORMITIES.

5. Seal box with packing tape and label contents with marker on all four sides as well as the top.


7. Keep a record of what books are drying where.

8. Stand books upright (head to toe) in well ventilated drying area with fans or air conditioners to keep the air circulating. A book is completely dry when it is no longer cool to the touch.

9. While air drying, in the manner described above, the pages of some books may start to pull out of their covers under the extra water weight. Turn these books over (head to toe, toe to head) every 30 minutes to evenly distribute the pull.

10. Especially damp books can be interleaved to remove additional excess moisture. Place unprinted, clean flat paper towels every 20 or 30 pages; be sure to change toweling and alternate pages every 15 minutes to prevent distortion. DO NOT USE FOLDED TOWELS AS THEY WILL PERMANENTLY DISTORT PAPER.

11. Some books will dry distorted and misshapen. This can be greatly reduced AFTER completely drying by placing volumes under light pressure or, in extreme cases, rebinding.

SUPPLIES:
- Pens,
- dehumidifiers,
- note, paper,
- large strong trash bags,
- fans,
- sponges,
- clean water source
- unprinted paper towels

To pack up and move materials to drying area include:
- markers for labeling,
- uniform 1 and 1 cubic foot, 200 test lb. cardboard boxes,
- unprinted, newsprint,
- wooden shipping pallets,
- large size shrink wrap
APPENDIX 5.2
RECOVERY PROCEDURES FOR WET BOOKS AND PAPER

WET BOOKS (as opposed to DAMP BOOKS) are defined as books that are dripping water. They are extremely fragile and must be handled carefully as pages can easily fall out and covers can separate from the text block.

WET BOOKS should be vacuum freeze dried by a professional in the case of a major emergency. Vacuum freeze drying dries the material with the least distortion as the water goes directly from the liquid to gaseous state (vapor) without passing through the solid state, i.e., ice never forms. Meat freezers and household freezers do allow ice to form and consequently are not adequate.

CAUTION:

1. Control the environment. Warm humid air encourages mold and mildew growth which can be more damaging than the original emergency. Try to keep the temperature below 70 Fahrenheit and the relative humidity below 55%. Use fans and dehumidifiers if needed. Keep the air in the area circulating.

2. Before starting any pack out procedures, know what the damaged materials are. Specifically, glossy paper (like magazine paper, art books, etc.) is not salvageable after 5-6 hours in water as the inks run and the pages become irrevocably stuck together. Move on immediately to concentrate on salvageable material. Leather and vellum bindings are extremely fragile and should be rescued early or not at all.

3. NEVER try to reshape or force wet books open as this will cause harmful distortion or further mechanical damage. Do not remove damaged covers; books can be rebound or treated AFTER they are dry.

4. Sponge off mud and debris with clean water but ONLY if the material does not have any water soluble components such as watercolors, runny inks, tempera or dyes. Such material should be freeze dried and cleaned when dry.

5. DO NOT OVER PACK BOXES!
   ° The box will be too heavy to move.
   ° The freezing process works well only if it is slow and uniform.
   ° Over packed boxes will prevent books on the inside from drying at the same rate as those near the outside.
   ° Books must have room to swell during freezing.

6. Minimize handling of wet books. Paper and bindings are very fragile when wet.
PROCEDURES:

1. Keep a written record of what volumes are in which box (by floor, range and call number) and remember to clearly label each box.

2. Use 2 and 1 cubic foot, 200 test lb. cardboard boxes to pack out and ship books to the freezer. A one cubic foot box will hold about 15 volumes and weighs about 50 pounds when loaded with water-logged books.

3. Wrap each book in one piece of unprinted newsprint; this will prevent colors from bleeding into one another and books from freezing together. Precut sizes to save time.

4. Pack books SPINE SIDE DOWN IN A SINGLE ROW ON THE BOTTOM OF THE BOX. THIS ARRANGEMENT IS VERY IMPORTANT! DO NOT STACK BOOKS OR OTHER MATERIALS ON TOP. WATER DAMAGED MATERIALS WILL SAG AND DISTORT especially under pressure, causing permanent deformities.

5. Seal box with packing tape and label contents with a marker on all four sides as well as the top.


7. Ship books to vacuum freeze dry facility (if available) in refrigerated or freezer trucks to prevent mold growth. Keep careful records of shipment contents and dates.

SUPPLIES:
pens, note paper, markers for labeling, uniform 1 and 1 cubic foot, 200 test lb. cardboard boxes, unprinted newsprint, wooden shipping pallets, large size shrink wrap, garden hoses, sponges, clean water source
APPENDIX 5.3

RECOVERY PROCEDURES FOR COMPUTER EQUIPMENT

Call College Department or Unit Administration, to report failure of individual office workstations or an emergency in an office area which jeopardizes computer equipment.

In the event of a central system failure or any emergency (electrical, plumbing, etc) which could cause the failure of a central system, inform UP Manila Central Administration or the UP Manila Disaster Risk Reduction and Management Council.

If the building is being evacuated, the following actions shall be taken:

PROCEDURES:

1. "Save" work being done on systems and close files.
2. Turn off workstation and peripherals.
APPENDIX 5.4

COLLECTION PRIORITIES FOR DISASTER RECOVERY: CRITERIA AND FORMAT

A. CRITERIA

Priority one
High priority materials characterized by one or more of the following criteria:

Strong collections
Collections that are irreplaceable, unique or that would be prohibitively expensive to replace, e.g. special collections and foreign language materials;
Collections that are heavily used.

Priority two
Core collection materials

Priority three
Lesser priority materials characterized as follows:

Materials that are not heavily used and that are not essential
Materials that could be replaced relatively easily

Materials that we own in another format or that could be readily replaced in another format

Subject areas where our collecting has been spotty and the collection is of marginal value and interest.

B. FORMAT FOR FLOOR PLANS AND PRIORITIES

FIRST FLOOR STAFF DIRECTORY

1. ________________ OFFICE PHONE: ___________________ HOME PHONE: ___________________
2. ________________ ___________________ ___________________
3. ________________ ___________________ ___________________
4. ________________ ___________________ ___________________
5. ________________ ___________________ ___________________

FIRST FLOOR PRIORITIES

☐
Priority 1:
☐ ☐ Priority 2:
☐ ☐ Priority 3:

☐ ☐ FIRST FLOOR MAP HERE
SECOND FLOOR STAFF DIRECTORY

<table>
<thead>
<tr>
<th>Office Phone</th>
<th>Home Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
</tbody>
</table>

SECOND FLOOR PRIORITIES

Priority 1:
Priority 2:
Priority 3:

SECOND FLOOR MAP HERE

THIRD FLOOR STAFF DIRECTORY

<table>
<thead>
<tr>
<th>Office Phone</th>
<th>Home Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
</tbody>
</table>

THIRD FLOOR PRIORITIES

Priority 1:
Priority 2:
Priority 3:

THIRD FLOOR MAP HERE
### FOURTH FLOOR STAFF DIRECTORY

<table>
<thead>
<tr>
<th></th>
<th>OFFICE PHONE</th>
<th>HOME PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FOURTH FLOOR PRIORITIES

- [ ]

**Priority 1:**
- [ ]

**Priority 2:**
- [ ]

**Priority 3:**
- [ ]

- **FOURTH FLOOR MAP HERE**

### FIFTH FLOOR STAFF DIRECTORY

<table>
<thead>
<tr>
<th></th>
<th>OFFICE PHONE</th>
<th>HOME PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FIFTH FLOOR PRIORITIES

- [ ]

**Priority 1:**
- [ ]

**Priority 2:**
- [ ]

**Priority 3:**
- [ ]

- **FIFTH FLOOR MAP HERE**
CHAPTER 6: Guidelines for Typhoon- and Flood-Related Disaster Management in UP Manila

Written by
Prof. Natividad F. Lacdan
Associate Professor, UP College of Arts and Sciences
Dr. Tristan Nathaniel C Ramos
Associate Professor, UP College of Dentistry
Engr. Noel D. Aquino
Engineer II, Philippine General Hospital

6.1 Rationale

The Philippines, lying within the inter tropical convergence zone or ITCZ (where the northeast and southwest trade winds meet), is frequently visited by tropical cyclones. On the average, twenty cyclones enter the Philippine Area of Responsibility (PAR), where ninety percent of these directly affect the country. Accompanying winds usually cause loss of human lives, and inflict great damage on infrastructures and human settlements. However, most casualties are attributed to heavy rains, floods and storm surges.¹

Heavy rains and floods cause damages to agriculture, infrastructures and community lifelines, contaminate water systems, including sources of drinking water that consequently have health impacts. Under extreme cases, wind speed, reaching beyond 250kph accompanying cyclones, can cause severe structural damages.

Along the coastal zones, massive destruction is inflicted on both natural and man-made structures due to the occurrence of storm surges (rising of water levels in the ocean several meters high that greatly inundate low lying coastal areas). Recent example of these, adversely affecting low lying coastal areas is the storm surge accompanying typhoon Haiyan (locally known as Yolanda). This typhoon, known as the strongest typhoon in the entire planet, has caused most devastating impacts on the lives and property of people in the Visayan region of the country. Over the hills and mountains, continuous heavy downpour can cause landslides (and mudflows), burying people and physical structures along the way.¹
The situation is aggravated by impacts of climate change. It has been forecasted that in 2020, rainfall will further increase during the southwest monsoon periods (June-July-August) in Luzon and in the Visayas. Flooding usually accompanies these heavy rains, especially in low lying areas.

One of the heavily populated coastal areas in the country is the city of Manila. It is widely known that Manila lies below zero sea level. It originally was a mangrove vegetated swampy area before vast areas were developed. It lies in the catch basin between Laguna Lake in the southeast and Manila Bay in the north. Indiscriminate commercial and residential developments have blocked the path of many rivers in MetroManila.

Even some of the waters of nearby Manila Bay have been reclaimed giving rise to more infrastructures. Being a coastal city, it is also threatened by tsunamis, storm surges, and severe flash floods. At present, the city cannot cope with flooding. Thus, flooding in urban cities, the city of Manila for that matter, is an increasing challenge to development.

Since UP Manila campus is located near Manila Bay, flooding is a perennial problem. UPM has been identified as a high risk area for floods based on the Hazard Map (APPENDIX 6.1) provided by Project NOAH.

Though the campus is not flooded per se, most streets within its perimeter areas are flooded rendering these impassable to any form of transportation. Consequently, mobility is hindered. The threat becomes more imminent with changing landscapes, clogged and deteriorating drainage, and improper waste disposal.

It is in this setting that this chapter focuses on handling emergency and crisis management due to typhoons and flood. This is to address the threats and mitigate the impacts / damages that may be inflicted upon on persons and property of UP Manila. Consequently, protection of constituents of the UP Manila is insured.

To realize these endeavors, proper coordination, cooperation, and communication among various teams who are knowledgeable, trained, and skilled in dealing with emergencies and crisis situations arising from typhoons/floods are of utmost importance.

There is a need to have a written plan and guidelines related to emergencies and disasters due to typhoons/floods. For this chapter, strategies and measures for mitigation, preparedness, response and rehabilitation/recovery in relation to emergencies and crisis situations arising from typhoons and flooding in UP Manila will be covered.
This Disaster Management Plan for typhoons and floods-related emergencies has the following objectives:

- to identify areas at risk of flooding in UP Manila.
- to develop an evacuation plan for all its constituents and be prepared when severe flooding, storm surge, or tsunami occur within the area
- to develop a system of saving lives and properties that could be damaged by typhoons and floods, storm surges and tsunamis
- to develop a recovery plan after severe flooding.

6.2 Management of Typhoon- and Flood-related Emergencies and Disasters in UP Manila

6.2.1 Prevention/Mitigation

6.2.1.1 Conduct Risk Assessment by undertaking the following mitigating measures to reduce impacts of typhoons/ floods in UP Manila

- Identify vulnerable areas to typhoons and floods in UP Manila
  + Identify equipment and important documents that could be damaged in case flooding occurs.
  + Identify electrical and water supply areas that are prone to flooding.

= Electrical sources should be transferred to higher floor levels identified for evacuation purposes to maintain electricity

= Water supply areas should be protected from contamination
+ Identify facilities and other physical structures that are prone to flooding.

= Counter measures should be taken in identified low lying areas in UP Manila prone to flooding (e.g. by modifying the floor level, placing barriers, if possible).

- Address causes related to flooding (especially anthropogenic causes) such as, waterways (dredging), drainage (declogging) and improper solid waste management

+ Drainage system should always be checked or cleaned valves should be installed to prevent back flow of water from the drains

6.2.1.2 Inspection and Maintenance

- check appropriate location and recommend transfer of generators as soon as possible (long term)

- ensure the proper maintenance of generators

6.2.2. Preparedness Guidelines

This covers awareness and communication in general. Specifically, it includes the following:

- Systematic plan of action to mitigate impacts

- Enhanced preparedness of UP Manila

- Improved capacity to deal with emergency cases
6.2.2.1 Detect promptly the possible occurrence of floods

+ Monitor local conditions, in coordination with PAG ASA, to be able to advise and provide early forecast of typhoons and floods. This is to ensure that an Early Warning System is in place.

+ For this purpose, it is recommended that the DOST PAG ASA Public Storm Warning Signals, DOST PAG ASA Heavy Rainfall Warning (HRW) Levels, and Thunderstorm Warning Levels be adopted.

DOST PAG ASA Public Storm Warning Signals

(APPENDIX 6.2)

The DOST PAG ASA Public Storm Warning Signal System was prepared essentially as a guide to inform the public on the meaning of the public storm signal numbers. Given the storm signal number raised, the guide describes the nature of the typhoon cyclone (to include wind speed for a particular time duration) and the alert level status that the disaster committees/units must assume. It also suggests what courses of action to take corresponding to the public storm signal number raised.

DOST PAG ASA Color Coded Heavy Rainfall Warning (HRW) Levels

(APPENDIX 6.3)

DOST PAG ASA also made a system to warn the public of the probability of rainfall occurrence through color codes.

Color Yellow is on an advisory status. This indicates that there is a possibility of flooding in low lying areas and in areas near the river channels.
Code Orange means that alert status has been raised, indicating flooding is threatening and that the concerned community must be prepared.

Color Red means that the condition is on an emergency status. Active community response is strictly observed since serious flooding is foreseen. Evacuees are expected to be transferred to higher grounds.

Aside from the meanings of the color codes, each respective color code is provided with the manner how the particular information will be disseminated.

**DOST PAG ASA Thunderstorm Warning Levels**  
( APPENDIX 6.4)

The Thunderstorm Warning Level System provided by DOST PAG ASA describes the status of each of the levels (i.e. Information, Watch and Warning). It also includes the manner of dissemination per warning status level.

**DOST PAG ASA Safety Tips in Preparing for Floods**  
(APPENDIX 6.5)

This forms part of the leaflet prepared by DOST PAG ASA on Floods that lists down the courses of action to take “Before the flood, When warned of the flood, During the flood and After the flood”

+ The UPM Administration shall take appropriate course of action (e.g. class suspension, etc.) based on the following:
  - on-site reports relayed by the UP Manila Security Services
6.2.2.2 Written Plan

Written Plans should cover information education activities, an evacuation plan, and a post recovery plan to enhance awareness and facilitate preparedness among UP Manila constituents. These will also include the dissemination of DOST-PAG ASA flyers/leaflets, such as, Public Storm Warning Signals, Heavy Rainfall Warning Levels, Thunderstorm Warning Levels, and Safety Tips in preparing for floods.

6.2.2.2.1 Risk Reduction Plan

6.2.2.2.1.1 Designate high rise buildings in UP Manila such as the Central Block, SOJR building, DOPS, etc., for possible evacuation sites. The concrete building walls could withstand voluminous water pressure during passage and the upper floors could be haven during disaster. These buildings have facilities that could provide shelter, protection and basic needs for water, shelter, and basic life protection.

6.2.2.2.1.2 Ready ample and basic necessities at least enough for 1 week. These include:

- water supply;
- ready to eat foods;
- first-aid kit and medicine. Include industrial disinfectants;
- maintenance tools for minor repair works;
- flashlights with extra charged batteries;
- candles and matches as option or back-up for illumination;
- sleeping materials like blankets, mattresses;
- clothing materials and items like toothpaste and brush, soap, towels;
- laundry soap, detergents, etc.;
- personal protective equipment like boots, gloves, vests, etc.;
- portable generators with extra fuel, grease, and lubricants, etc.;
- communication radios, whistles, etc.

6.2.2.2.1.3. Ready transportation services and accessories (extra tires, jacks, etc.)
- ambulances for conduction of the injured and ailing patients; include wheel chairs, stretchers, etc.;
- rafts and canoes including drivers, rafters, etc.;

6.2.2.2.1.4. Ready floor evacuation plans to directly guide evacuees to evacuation sites with less delay

6.2.2.2.1.5. Signage systems for UP Manila buildings and the Philippine General Hospital must be installed on conspicuous site for standard references and communication requirements;

6.2.2.2. Evacuation Plan (site to evacuation building)

All UP Manila buildings must provide an evacuation plan to render prompt, safe and orderly passage of evacuees from affected site to designated evacuation buildings;

6.2.2.2.3. Post-Disaster Recovery Plan

Must have a Recovery team to undertake the following:

6.2.2.2.3.1. Accounting of evacuees and missing persons including identification;

6.2.2.2.3.2. Accounting of cadavers/dead people and appropriate guidelines to be followed during recovery;

6.2.2.2.3.3. To conduct inspection to post-affected areas to account for lost equipment/facilities
6.2.2.2.4. **Rehabilitation Plan**

A Rehabilitation team is tasked to undertake the following:

6.2.2.2.4.1. To conduct psychosocial support and services for evacuees and victims

6.2.2.2.4.2. To undertake appropriate management of collected cadavers based on guidelines provided by the Dept. of Pathology, College of Medicine (c/o Dr. Raquel Fortun)

6.2.2.2.4.3. Inspect all affected buildings, equipment, and facilities to recommend for repairs required thru projects. Close coordination with the Engineering department and Internal Audit, is highly recommended

6.2.2.2.4.4. Evaluate and recommend for those buildings, equipment, and facilities that must be condemned. Close coordination with the Engineering department, Internal Audit and Property Division, and COA is highly recommended.

6.2.2.2.4.5. To restore all basic services in water supply, power (electricity), communication, and transportation services to normalize operation;

6.2.2.2.4.6. Recommend rehabilitation projects for larger services like schools, buildings, service roads, etc., that also require large government funds

6.2.3 **Responses**

In responding to disasters related to floods, storm surges or tsunamis, time is of the essence. It becomes a very important, critical factor. In Table 6.1, a Time Flow of Response is provided to serve as a guide in the conduct of a Flood Drill.
Table 6.1 Time Flow of Response in a Flood Drill

<table>
<thead>
<tr>
<th>TIME (in minutes)</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>00.00</td>
<td>Routine activities being undertaken by UP Manila constituents</td>
</tr>
</tbody>
</table>
| 00.00-00.01      | Flood/Storm surge/tsunami alert has been raised by the Local Government/PAG ASA  
                   call out CODE “8” (standard code for Floods and Typhoons) has been disseminated |
| 00.01-00.02      | Operationalization of the Incident Command System  
                   Upon the instructions of the Incident Commander (The Chancellor), all Emergency Response Teams (ERTs) should have facilitated the Immediate and speedy evacuation of UPM constituents to identified evacuation sites for floods/storm surges/tsunamis as per Evacuation Plan. |
| 00.02-00.10      | Evacuation is expected to have been completed by this time |
| 00.10-00.15      | Actual Headcount or Accounting of Warm bodies is accomplished at the Evacuation Sites  
                   Immediate medical attention by Medical Teams is given to injured evacuees |
| 00.15-00.17      | Prompt reporting of accounted warm bodies, missing persons, and casualties to the Incident Commander by the Evacuation Teams and Search and Rescue Teams has been undertaken |
REFERENCES CITED

1. Department of Science and Technology / Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST/PAG ASA). Undated. Primer on Floods, Quezon City

2. Department of Science and Technology / Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST/PAG ASA) . 2012 . Primer on Tropical Cyclones, Quezon City


4. Project NOAH report 2013 covering Hazard Map
APPENDIX 6.1 - NOAH Hazard Map indicating UP MANILA as a High Risk Areas for Floods
### APPENDIX 6.2 - DOST PAG ASA Public Storm Warning Signals

<table>
<thead>
<tr>
<th>PUBLIC STORM WARNING SIGNAL NO.</th>
<th>MEANING</th>
<th>WHAT TO DO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A Tropical Cyclone will affect the locality. Winds of not more than 60 kph may be expected in at least 36 hours*.&lt;br&gt;Direkt preparation plan must now be activated to alert status.</td>
<td>Listen to your radio for more information about the weather disturbances. Check the ability of the house or household strong winds and strengthen it if necessary. The people are advised to monitor the latest severe weather bulletin issued by PAGASA every six hours. In the meantime, business may be carried out as usual except when flood occurs.</td>
</tr>
<tr>
<td>2</td>
<td>A moderate Tropical Cyclone will affect the locality. Winds of 61 to 100 kph may be expected in at least 24 hours*.&lt;br&gt;Danger agencies/organizations concerned must act now to alert their communities.</td>
<td>Special attention should be given to the latest position, the direction and speed of movement of the cyclone may intensify and move towards the locality. The general public, especially people travelling by sea and air are confined to avoid unnecessary risks. Proper properties before the signals are upgraded. Board up windows or put storm shutters in place and securely fasten it. Stay at home.</td>
</tr>
<tr>
<td>3</td>
<td>A strong Tropical Cyclone will affect the locality. Winds of 101 to 150 kph may be expected in at least 18 hours*.&lt;br&gt;Danger agencies/organizations concerned must now be ready to act in response to actual emergency.</td>
<td>Keep your radio on and listen to the latest news about typhoons. Everybody is advised to stay safe and strong houses. Evacuate from low-lying areas to higher grounds. Stay away from coasts and riverbanks. Watch out for the passage of the &quot;Eye&quot; of the typhoon.</td>
</tr>
<tr>
<td>4</td>
<td>A very intense typhoon will affect the locality. Winds of more than 151 kph may be expected in at least 12 hours*.&lt;br&gt;Danger agencies/organizations concerned must now be ready to act in response to actual emergency.</td>
<td>Stay in safehouses or evacuation centers. All travel and outdoor activities should be cancelled.</td>
</tr>
</tbody>
</table>

*Times are valid only the first time the signal number is raised.

Published by

PAGASA - DOST
Public Information Unit
Office of the Administrator

www.pagasa.dost.gov.ph
dial-a-weather: 433-ULAN (8526)
Telex No. 927/9308/434-2686

Revised 2012

tracking the sky... helping the country!
APPENDIX 6.3 - DOST PAG ASA Color Coded Heavy Rainfall Warning (HRW) Levels

<table>
<thead>
<tr>
<th>WARNING</th>
<th>MEANING</th>
<th>DISSEMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory</td>
<td>FLOODING IS POSSIBLE in low-lying areas and areas near the river channel</td>
<td>This will be disseminated thru SMS, Twitter and website</td>
</tr>
<tr>
<td>Alert</td>
<td>COMMUNITY PREPAREDNESS</td>
<td>This will be disseminated thru SMS, Twitter, website and fax</td>
</tr>
<tr>
<td>Emergency</td>
<td>COMMUNITY RESPONSE</td>
<td>This will be disseminated thru SMS, Twitter, website and fax</td>
</tr>
<tr>
<td></td>
<td>SERIOUS FLOODING is EXPECTED</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EVACUATION to higher grounds</td>
<td></td>
</tr>
</tbody>
</table>

Disclaimer: Rainfall threshold values are arbitrary and may vary depending on the area of concern and this will be refined as more data become available.

Sample Heavy Rainfall Warning:

**YELLOW ADVISORY:**
Issued at 04:00 AM, 01 August 2012 (Wednesday)
Target Areas: Pasay, Taguig, Parañaque, Las Piñas, Pateros, Muntinlupa

Heavy rainfall over Pasay, Taguig, Parañaque, Las Piñas, Pateros, Muntinlupa and nearby areas, and most likely to continue for the next 3 hours.
* POSSIBLE FLOODING in low-lying areas and those located near the river and creek channels.
* People are advised to MONITOR the weather condition and WATCH OUT for the next warning.

**ORANGE WARNING:**
Issued at 10:00 PM, 06 August 2012 (Tuesday)
Target Areas: Metro Manila

Heavy to intense rainfall (7.5 to 30 mm) was observed over Metro Manila for the past hour. Occasional moderate to heavy rainfall is expected and most likely to continue for the next 3 hours.
* FLOODING IS THREATENING in low-lying areas and those located near the river channels
* People are alerted for POSSIBLE EVACUATION and advised to closely MONITOR the weather condition and WATCH OUT for the next warning.

**RED WARNING:**
Issued at 09:00 AM, 07 August 2012 (Tuesday)
Target Areas: Metro Manila

Heavy to torrential rainfall (16-40mm/hr) was observed over Metro Manila for the past 2 hours. Expect heavy to intense (15-30mm/hr) rainfall with occasional torrential (>30mm/hr) within 2 hrs. Flooding over low-lying areas and those located near the river channels.
* Residents in high risk areas are advised to EVACUATE to higher grounds and MONITOR the weather condition and WATCH OUT for the next warning.

Tel No. (63-2) 929-4865 (w/ Fax) 434-9040
## Thunderstorm Warning Levels:

<table>
<thead>
<tr>
<th>WARNING</th>
<th>MEANING</th>
<th>DISSEMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>Thunderstorm is less likely to develop in the Metro Manila area</td>
<td>This will be disseminated thru SMS, Twitter and website</td>
</tr>
<tr>
<td>Watch</td>
<td>Thunderstorm formation is likely within the next twelve (12) hours. This is more general than a warning.</td>
<td>This will be disseminated thru SMS, Twitter, website and fax</td>
</tr>
<tr>
<td>Warning</td>
<td>Thunderstorm is threatening a specific area(s) within the next 2 hours. Updates will be issued as frequent as necessary</td>
<td>This will be disseminated thru SMS, Twitter, website and fax</td>
</tr>
</tbody>
</table>

### Sample Thunderstorm Warning:

**Thunderstorm Information**  
*Issued at 10:00 am, 4 May 2012*

Thunderstorms are less probable to develop within the next 12 hours over Metro Manila. However, ALL are still advised to watch out for update on thunderstorm occurrence in your area.

**Thunderstorm Watch**  
*Issued at 10:00 am, July 2012*

Thunderstorms are highly probable to develop within the next 12 hours over Metro Manila. However, ALL are still advised to watch out for update on thunderstorm occurrence in your area.

**Thunderstorm Warning**  
*Issued at 2:00 pm, 4 August 2012*

Thunderstorm over the vicinity of CAMANAVA, Quezon City Taguig, Pasay, Parañaque, Las Piñas, Makati, Pateros and nearby areas.

All are advised to watch out for thunderstorm updates.
SAFETY

BEFORE THE FLOOD
- Be informed of the daily weather conditions and forecasts from PAGASA.
- Be aware of how often and to what extent your location is likely to be flooded.
- Know the flood warning system and evacuation plan of your community and make sure your family knows them.
- Identify an evacuation area for the family and livestock.
- Assign specific tasks and responsibilities to family members according to an evacuation plan.
- Keep a stock of food, which requires no or little cooking and refrigeration, good for at least three days.
- Keep battery-operated radio and flashlight, spare batteries, cellphones, emergency cooking equipment, candles, matches and first aid kit handy in case of emergency.

WHEN WARNED OF FLOOD
- Listen to your radio for emergency and possible evacuation instructions.
- Securely anchor weak houses.
- Store drinking water in containers, water service may be interrupted.
- Move household belongings to upper levels.
- Get livestock to higher ground.
- If advised to evacuate, DO SO. Don’t panic, move to a safe area before access is cut off by flood waters.
- Turn off main electricity switch and gas valve, and lock your house before evacuating.

TIPS

PREPARING FOR FLOODS IS A SHARED RESPONSIBILITY.

DURING THE FLOOD
- Stay indoors.
- Do not attempt to cross rivers or flowing streams where water is above the knee.
- Do not go swimming or boating in swollen rivers.
- Beware of contaminated food and water.

AFTER THE FLOOD
- Re-enter your house with caution using flashlights, not lanterns or torches. Flammables and dangerous animals like snakes may be inside.
- Be alert for fire hazards like broken electric wires.
- Do not eat food and drink water until they have been checked for contamination.
- Report broken utility lines (electricity, water, gas, and telephone) to appropriate agencies/authorities.
- Do not turn on the main switch or use appliances and other equipment until they have been checked by a competent electrician.
- Consult health authorities for immunization requirements.
- Do not go “sight-seeing” in disaster areas. Your presence might hamper rescue and other emergency operations.
Chapter 7

Guidelines for Earthquake-Related Disasters

Written by:
Engr. Lauro C. Canceran
Engineer III, Campus Planning Development and Maintenance Office
UP Manila

7.1 Rationale

It is not possible to prevent earthquakes or change the likelihood of an earthquake occurring. However, we can greatly increase our chances of safety and survival, by being aware and prepared. Since knowledge and preparation are keys to survival during and after an earthquake, we should take steps to become informed.

Dangers Associated with Earthquakes

The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Most casualties result from falling objects and debris or collapsing structures. Aggravating factors are the breakdown of transportation and communication lines.

According to Phivolcs if the earthquake is coming from the West Valley Fault mainly ground shaking however if the source is from the Manila Trench there may be a tsunami. Enormous number of casualties are expected if there is a tsunami.

Injuries from ground shaking are commonly caused by:

- Partial building collapse, such as falling masonry, collapsing walls, falling ceiling plaster, etc.
- Flying glass from broken windows
- Overturned bookcases, filing cabinets, fixtures, furniture, office machines and appliances
- Fires, broken gas lines, etc. These dangers may be aggravated by lack of water due to broken mains
- Fallen power lines
- Inappropriate actions resulting from panic
Table 7.1: PHILIPPINE DESTRUCTIVE EARTHQUAKES

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Origin</th>
<th>Location</th>
<th>Date</th>
<th>Mortality</th>
<th>Missing</th>
<th>Injured</th>
<th>Damages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tectonic</td>
<td>Moro Gulf</td>
<td>August 16, 1976</td>
<td>4791</td>
<td>2288</td>
<td>9928</td>
<td>P 10 billion</td>
</tr>
<tr>
<td>2</td>
<td>Tectonic</td>
<td>Luzon Island</td>
<td>July 16, 1990</td>
<td>1666</td>
<td>1000</td>
<td>More than 3000</td>
<td>Unknown</td>
</tr>
<tr>
<td>3</td>
<td>Tectonic</td>
<td>Luzon Island</td>
<td>November 30, 1946</td>
<td>600⁷</td>
<td>3000⁷</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>4</td>
<td>Tectonic</td>
<td>Casiguran, Aurora</td>
<td>August 2, 1968</td>
<td>271</td>
<td>261</td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td>5</td>
<td>Tectonic</td>
<td>Mindoro</td>
<td>November 15, 1964</td>
<td>78</td>
<td>430</td>
<td></td>
<td>P 5.15 million</td>
</tr>
<tr>
<td>6</td>
<td>Tectonic</td>
<td>Negros Oriental</td>
<td>February 6, 2012</td>
<td>51</td>
<td>62</td>
<td>112</td>
<td>P 3.83 million</td>
</tr>
<tr>
<td>7</td>
<td>Tectonic</td>
<td>Manila</td>
<td>June 19, 1665</td>
<td>19</td>
<td>Unknown</td>
<td>Unknown</td>
<td>P 4.175 million</td>
</tr>
<tr>
<td>8</td>
<td>Tectonic</td>
<td>Laoag</td>
<td>August 17, 1993</td>
<td>16</td>
<td>47</td>
<td></td>
<td>P 4.175 million</td>
</tr>
<tr>
<td>9</td>
<td>Tectonic</td>
<td>Mindanao Island</td>
<td>March 5, 2002</td>
<td>15</td>
<td>100</td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td>10</td>
<td>Tectonic</td>
<td>Sultan Kudarat</td>
<td>March 6, 2002</td>
<td>8</td>
<td>41</td>
<td></td>
<td>P 4.175 million</td>
</tr>
</tbody>
</table>

Table above presents the impact of earthquakes in terms of number of lives and economic loss. The most destructive earthquake considering lives lost, was that which occurred in Moro Gulf Mindanao claiming 4,791 lives.

In terms of damages to property and economic losses, the most severe was in July 16, 1990 where a tectonic earthquake magnitude 7.8 resulted to economic loss approximately 10 billion pesos.

Figure 7.1 below shows that the Philippines is being located in the Pacific Rim. It also shows that the western part of Luzon and eastern part of Visayas and Mindanao are prone to subduction and resultant ground shaking.

Figure 7.1 Philippine Tectonic Setting (Source: OCD NDRRMC)
Why UP Manila is Vulnerable to Earthquake-related Disasters

Figure 7.2: Liquefaction Hazard Map in Metro Manila (GMMA Project Report 2013)
Figure 7.2 above shows that the entire city of Manila is located in the area with high susceptibility to liquefaction due to earthquake.

Since UP Manila is within this area, prevention and mitigation measures should be in place to minimize possible severe impacts.

Mitigation measures to be implemented are:

- Soil Investigation should be conducted prior to construction of new buildings in UP Manila
- Installation of piling post for stronger foundation and reduce risk of liquefaction
- Adequate sizing of foundation should also be observed during the design stage

(Mitigation should be done by CPDMO in coordination with the respective colleges and units)
Figure 7.3 above shows that Manila, Pasay and Malabon are within the Tsunami Inundation Area. This makes UP Manila highly vulnerable to tsunami and its impacts. Tsunami risk in UP Manila is present which is attributed to the Manila Trench that is located near the Manila Bay side.

7.2 Prevention/Mitigation Guidelines

Non-Structural Mitigation²

A detailed description of non-structural mitigation measures for earthquakes as recommended in general by Phivolcs is presented in Appendix 7.1.

Structural Mitigation³

Inspection
This is a quick check that visually determines whether the building is structurally sound and strong. Presence of cracks and buckling in critical structures such as column and beam shall be noted, reported and corrected. This should be done regularly by the Prevention/Mitigation Team that will soon be organized per college or unit in coordination with UP Manila-CPDMO and OETS-PGH.

Maintenance
A complete and thorough examination of each Cabinet and large equipment hanging cabinet shall be properly secured to prevent tipping. Large chemical cabinet shall have lip and support to prevent tipping over in case an earthquake occurs. This should be done by the Prevention/Mitigation Team that will be organized per college or unit.

Risk Assessment of UP Manila Buildings and other structure

Risk assessment in the form of Structural Integrity determination shall be conducted especially on high rise buildings in UP Manila/UP-PGH (e.g. Central Block in PGH, SOJR, CAMP and Dentistry Buildings) that carry the highest risk among all structures.

- Structural Integrity Testing which includes the following:
  - Destructive Testing:
    - Concrete Core Test (CCT)
  - Non-Destructive Testing:
    - Rebound Hammer Test (RHT)
    - Rebar Inspection/Scanning
- Design Analysis
- Soil Bearing Capacity Test

- Survey on termite infestation among UP Manila buildings and structure.

**Implement Appropriate Structural Mitigation Measures in UP Manila**

- Retrofitting of building structure
- Eliminate or control of termite infestation which affect building and structure in UP Manila.
- Design and construct UP Manila buildings which are resilient to the impact of liquefaction and tsunami.

### 7.3 Preparedness Guidelines

Preparedness guidelines are basically similar with chapter 5 in this manual (Guidelines for Fire Related Emergencies) except that the Phivolcs will have the key role in guiding the UP Manila Disaster Preparedness Team in disaster planning and the conduct of evacuation drills for earthquake.

**Evacuation Plan**

Of utmost importance is the identification of a safe evacuation site for earthquake especially when high rise building structures are situated along Pedro Gil and Padre Faura streets.

A very important component of the preparedness plan is the provision of adequate basic supplies/equipment such as:

- Safe drinking water
- Dry Food
- candy bars,
- dried fruits,
- Cookies, crackers, etc.
- First aid kit with routine medications (aspirin, acetaminophen, cough/cold tablets, allergy tablets, etc.)
- Extra prescription medications
- Flashlight/batteries
- Chemical light sticks, matches
- Small radio(battery- operated portable)
- Small and large plastic bags
- Toiletries/personal hygiene items
• whistle
• waste containers
• blankets

REMEMBER: Evacuees could be stranded for up to one week. Each UP Masnila unit/college should store enough supplies to meet the needs of their constituents.

Earthquake Drills

Regular earthquake evacuation drill should be conducted at least 2-4 times a year by UP Manila in coordination with the Bureau of Fire Protection, Phivolcs, NDRRMC, OCD, LGU (City Government) and the soon to be organized UP Manila Disaster Risk Reduction and Management Council.

Table 7.2  Time Flow of Response in an Earthquake Drill

<table>
<thead>
<tr>
<th>Time</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00 min</td>
<td>Normal activities ongoing at UP Manila Campus</td>
</tr>
<tr>
<td>0:00 - 0:01 min</td>
<td>Earthquake felt in UP Manila</td>
</tr>
<tr>
<td></td>
<td>• Warning system for earthquake activated, Intermittent alarm shall be sounded off</td>
</tr>
<tr>
<td></td>
<td>• To facilitate prompt exit, occupants nearest the door should open it.</td>
</tr>
<tr>
<td></td>
<td>• Building occupants applied the <strong>duck, cover and hold position</strong></td>
</tr>
<tr>
<td></td>
<td>• Building occupants take cover and hold on under a sturdy table or strongly supported doorway</td>
</tr>
<tr>
<td></td>
<td>• Don’t panic, keep calm</td>
</tr>
<tr>
<td></td>
<td>• Watch out for falling objects.</td>
</tr>
<tr>
<td>0:01 - 0:03 min</td>
<td>When <strong>the shaking stops:</strong></td>
</tr>
<tr>
<td></td>
<td>• Call out “<strong>code 6</strong>”</td>
</tr>
<tr>
<td></td>
<td>• Once a “code 6” call out is summoned, all ERT</td>
</tr>
</tbody>
</table>
| 0:03 – 0:10 min | Incident Command (IC) Post is identified. Incident Commander who is the highest ranking officer onsite and ERT officers meet at the IC Post.  
Emergency Medical Service (EMS) reports to Incident Commander (IC) and sets-up the Treatment Area.  
ERT members in-charge for security and UP-PGH security team ensures crowd and traffic control and promotes 1-way traffic (vehicular and pedestrian) throughout the Compound. This team also secures the Incident Command Post (ICP) and the Treatment Area (TA)  
Building occupants including visitors and guest shall be accounted for, (headcount) by the Evacuation Team Leader once in the designated evacuation area. |
| marshals shall report their respective situations to the incident commander which is the Chancellor or his designated representative.  
- Respective floor warden/evacuation team shall facilitate evacuation of all building occupants to the nearest exit route  
- In earthquake without fire, the first responder/fire extinguisher team shall also help in the evacuation of all building occupants.  
- Be alert, listen to floor warden/evacuation team's instructions, walk out of the building in an orderly manner.  
- While walking along the corridors to the nearest exit of the building, be alert and look out for falling debris.  
- DON'T...Run, DON'T Push, DON'T Talk, DON'T Return, DON'T bring your things, DON'T use the elevator (if any)  
- Quietly but quickly proceed to the designated evacuation area and wait for further instructions from the evacuation team  
- NEVER go back to the building once you are outside. |
7.4 **Response Plan**

The basic aim of response due to earthquake is the safe evacuation of all UP Manila constituents. It has been emphasized that appropriate evacuation sites shall have been identified already for the safety of the evacuees.

In case of tsunami alert evacuation should be at an elevated area which is considered safe by the Phivolcs.

In case of possible liquefaction appropriate evacuation site shall be identified as alternatives upon the recommendation by the Phivolcs.

For pure ground shaking events the procedures in Table 7.2 (Time Flow of Response in an Earthquake Drill) shall be followed.

7.5 **Rehabilitation/Recovery Plan**

Activities aimed at returning the university back to normal operations shall include the following:

- Psychosocial support services
- Management of dead bodies
- Buildings shall be inspected by structural engineers for possible
damage after an earthquake

- Vulnerable areas and structures must be identified according to the risk of possible collapse
- Categorizing buildings as to which may still be safe for operation, for retrofitting or for condemn
- Facilitate the rehabilitation of recovery and repair needed for normal operation.

**Immediate Recovery Plan to restore operation of campus operations**

Depending on the extent of damage, the Recovery Team of every UP Manila College/Unit shall conduct an investigation and thorough evaluation on the impact of the earthquake.

Based on their assessment, the Recovery Team can make an evaluation report to the UP Manila Risk Reduction Council and recommend appropriate to facilitate recovery.

The UP Manila Disaster Risk Reduction Council shall decide as to which projects shall be prioritized for immediate and long term recovery.

**References**

1. Phivolcs report 2012
2. LAFD - Emergency Preparedness Booklet
3. US Federal Emergency Management Agency
5. PHIVOLCS website: [www.phivolcs.dost.gov.ph](http://www.phivolcs.dost.gov.ph)
Appendix 7.1.

Non Structural Mitigation for Earthquakes

EQUIPMENT AND FURNISHINGS
• Strap rows of multiple file cabinets, mainframes, book cases, etc. together. High racks should be secured together on top and to the floor on the bottom.
• Secure desktop computers, and typewriters.
• Keep computer CPUs on the floor next to their work stations.
• Secure cabinet doors with positive latches.
• Store hazardous materials correctly and educate all your employees about them.
• Secure freestanding, moveable partitions.

Secure furniture and other property
Preventing earthquake damage is mostly about securing your belongings. Toppling furniture and objects falling off their designated places, account for most of the financial loss that may be incurred during earthquakes. Ensure that glass cabinets, bookshelves, and other tall furniture are securely anchored to the wall or floor.

OVERHEAD
Seen and unseen objects overhead and above suspended ceilings may pose hazards to workers below. Secure all objects that are above desktop level. Check for diagonal bracing wires in suspended ceilings. Ensure proper restraint of “stem” light fixtures and fluorescent light panels. Securely attach decorative ceiling panels, spotlights, speakers, air conditioning units, etc. Check above suspended ceilings for poorly attached ducts, cables, etc.

WINDOW AND MIRROR GLASS
Sharp shards may fall or be thrown across a room. Consider safety glass, wire glass or solar/safety film. The solar/safety film has the advantage of improving the insulating factor of the window. The energy saving may pay for the cost of the film. There are cost-free protective measures that you can use if the glass where you are is not safety type. You can pull down and close shutters or draw drapes. Even blinds that are pulled down, but not close, offer some additional protection from flying glass.

GAS APPLIANCES
Stove, water heater, furnace, etc. may run on liquefied petroleum gas. These appliances may be found in laboratories, PGH Dietary Department and the University and PGH Canteens. Unsecured gas
appliances may crush someone or rupture their gas feed line during a quake. If these objects move or topple, the resulting gas leak may cause fire and or explosions which may destroy facilities which would otherwise have only minor damage. Secure all gas appliances to a wall stud and use flexible gas lines. The flexible gas line should be longer than necessary to allow for some movement. The appliance should be secured top and bottom to prevent tipping, rolling and sliding. Use heavy plumber's tape or braided cable to secure your water heater to the studs in the wall.

HEAVY FURNITURE
Furniture will move and fall during many types of disasters, especially tall, top-heavy items. Secure the furniture to the wall. Use braided metal cable, chain, or angle brackets to secure all furniture to a wall anchor. Most often a wall anchor is an appropriately sized eyescrew. Be sure you screw wall anchors into a stud (A stud is the vertical 2 x 4 inch wood post that supports your wall). They are normally spaced at 16 inch intervals. Use of an inexpensive electronic stud finder makes the job much easier with less damage to your walls. Screws should always be used, never nails. Nails will pull out during a large earthquake.

Secure appliances
Appliances like televisions, computers, stereo equipment, and the like should likewise be properly secured. There are a number of materials available to do just that. You may use adhesive backed latches, nylon cords, wires, elastic guardrails, and shelf edges to stop these from sliding down to the floor.

REFRIGERATORS
Refrigerators are extremely heavy and some of them are on wheels. Because of their weight they may crush someone if they move and tip. Secure refrigerators, top and bottom, to insure they remain in place and upright during any earth movement. Use commercially available adhesive straps. Fasten or anchor one end into a wall stud and adhere the strap securely to a structural component of the refrigerator. Do not secure anything to the coils in the rear of the box. These are made of lightweight material and will not support the weight of the unit. Follow manufacturer's directions.

HANGING PICTURES, MIRRORS, CLOCKS, ETC.
Anything simply hanging on a wall will come flying off in a large shake. Use an appropriately sized eyebolt and a hollow wall anchor for lighter items. Larger items will require an eyes crew that is screwed into a wall stud.
DECORATIVE ITEMS AND BRIC-A-BRAC ON SHELVES, BOOKCASES, ETC.
Unsecured objects will fall during a shock. Run a wire, monofilament fishing line, or guardrail across the shelf front. (The line/rail should be placed 1/3 the height of the shelf, from the bottom.) Objects can be secured in place with Velcro, 2-sided tape, porcelain glue. Place large or heavy objects on the bottom shelf. Heavy items can be secured with industrial strength Velcro.

FLAMMABLE LIQUIDS
These liquids which can be found in laboratories and chemical storage rooms in UP Manila may spill which may pose hazard. Spilled flammable liquids may cause fire and destroy a property that would have survived undamaged. Store all flammable liquids outside, in their original/proper containers, away from structures and vehicles. If you must store flammable liquids in University colleges and units, store them in the secured place, keep them in a cabinet with locking doors, and always store them on the lowest shelf.

HAZARDOUS MATERIALS
Unsecured or improperly stored hazardous chemicals which may be found in laboratories and chemical storage rooms may pose explosion or violent reaction hazard which may produce flammable gases or toxic airborne contaminants.
• Secure large containers of production chemicals or cleaning supplies.
• Ensure that all toxic items are in the correct containers and properly labeled.
• Ensure that all employees know what to do in case of a spill.
• Keep all large containers or vats of toxic, hot, or hazardous items covered to prevent surging in an earthquake. Large chemical container should be stored at the bottom of the chemical storage cabinet.

HOSPITAL BEDS LOCATED NEAR WINDOWS
Plate glass may break during a disaster. Relocate beds away from windows and tall heavy furniture. Apply safety film to all windows near areas where people stay or work. These should be observed and practiced to ensure safety of patient and other room occupants.

ELECTRICAL EQUIPMENT
Shock hazards exist if unsecured electrical equipment breaks its connections or exposes energized lines. Unsecured equipment may short out the power in your office or building.
• Secure any electrically powered equipment
• Have backup power generators for emergency lighting and to protect computers against data loss. Ensure that generators,
fuel tanks, battery packs, and fuel lines are properly secured.
• Secure emergency lighting.
• Secure telecommunication equipment, switches, and control boxes.
• Install and secure latches on cabinets

Secure light fixtures and other hanging objects

Light fixtures, pictures, mirrors and other hanging objects are also quite susceptible to cause damage during earthquakes. Pictures and mirrors should be properly secured on eyebolts on the wall, while lighting fixtures are best anchored on the ceiling’s structural support. In addition, do not hang heavy objects near the bed and in areas where people usually sit.

Store hazardous materials in a safe place

Hazardous chemicals such as paints, acids, and pesticides are extremely dangerous when spilled and mixed inadvertently. This could ignite fires and lead to severe losses. To prevent such damage, hazardous materials should be placed in appropriate containers, sealed tightly, and stored in a dry and secure area where the container is less likely to overturn if earthquake strikes. Incompatible chemicals should be stored separate from each other to prevent violent chemical reaction in case chemical spill occur.

Keep a fire extinguisher on hand

Fire extinguishers are very useful to have on hand in the event of an earthquake. These fire extinguishers preferably for class A,B and C fires should be strategically located near exit areas with proper label and markings. Small fires may ignite here and there, and the best way to prevent further damage is to nip those fires in the bud.
### Appendix 7.2
Evaluation Tool
Post- Earthquake Preparedness Drill

#### During the Earthquake (Continuous Ringing of the Bell)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop Cover and Hold (DCH)</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Designated area for DCH of room occupants</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Identified Team Leader or Responsible Person In-charge</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

#### After the Earthquake (Bell Stops Ringing)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room occupants evacuates the room in orderly fashion (Not running)</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Participants cover their head during evacuation</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>- Emergency Exits were pre-identified for room occupants</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>- Pre identified Evacuation Guides</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>- Evacuation Holding Areas Identified</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

#### Holding Area Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head count was done by Team Leaders</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

#### Incident Command

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set up a Command Post</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Incident Commander Identified</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>IC Organized his Team</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Took over all Head Count of evacuees</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Obtained reports from Team Leaders</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Declared the Building is safe</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Gave Order to return to rooms</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

#### Safety Officer

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determined if building is safe for occupancy</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Reported to IC that the Building is safe</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Search and Rescue Team</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Inspected all rooms and floors of the building</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>
Security

Established crowd control
Cordoned off the Evacuation Holding Area
Regulated entry and exit of Traffic

Medical Team

Able to establish an alternate ER
Patients needs attended to

Comments:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Name of Area/Cluster Evaluated: ________________________
Name of Evaluator: _______________________________
Date: __________________________________________

bleach solution. After 5 min. empty the bleach solution and let air dry
RATIONAL

Campus security plays an integral role in management decisions. The safety and security of the students, faculty and staff should be top priority. This security plan will outline the University’s approach to security concerns such as bomb threats and other explosive related emergencies. It also determines the role and responsibilities of each constituent in these scenarios.

It is expected that with the efficient implementation and dissemination of this security plan, all constituents will be equipped in responding to such emergencies and most importantly, campus security breaches will be lessened if not totally eliminated.

8.1 BOMB THREAT PREVENTION

Bomb threats as defined in the Security and Safety Standard Operating Procedures Manual are the psychological weapons which are employed with much effectiveness to disrupt the normal course of business life. The problem concerning bomb threats are its utter effectiveness in a society which is dealing with factual terrorist threats on a daily event especially when certain bomb threats actually concludes with an actual explosion involving either a high explosive (HE) device or an incendiary bomb.

In order to reduce the potential placement of an explosive or incendiary device, physical security must be tightened. This will not only reduce the chances of having a bomb brought in to the premises, but will also minimize the search process. The following should be observed during the search process:

1) During the inspection of the building, particular attention should be given to the potential concealment areas listed in the succeeding section;

2) Establish and enforce strict procedures for the control and inspection of packages and materials going into critical areas;

3) Develop and enforce positive means of identifying and controlling
personnel who have authorized access to critical areas and denying access to unauthorized personnel;

4) Instruct all security and maintenance personnel to be alert for suspicious individuals and the presence of foreign or unusual objects or parcels;

5) Instruct all security and maintenance personnel to increase surveillance throughout the building;

6) Ensure that doors and/or access ways to such areas as boiler rooms, mail rooms, computer areas, switchboards, elevator machine rooms and utility closets are securely locked when not in use;

7) Check key control procedures to see that all keys to all locks are accounted for;

8) Regular inspection of fire exits to make sure that they are not obstructed;

9) Monitor fire hose racks and fire extinguishers regularly to ensure that they are not damaged;

10) Increase patrols and surveillance of receiving areas, garages and parking areas;

11) Ensure adequate protection for classified documents, proprietary information and other records essential to the operation of the University;

12) Regular maintenance of perimeter fences/walls/barriers to ensure adequate clear zones;

13) Check all exterior and protective lighting for proper operation and adequate illumination;

14) Protect ground floor windows with heavy mesh, grillwork, or protective glass;

15) Conduct daily checks for good housekeeping and proper disposal of combustible materials;

16) Store or arrange for immediate procurement of sand, sandbags, or mattresses to be used as shielding in the event an explosive device is located in the building;

17) In the event of electric power shut off, have flashlights or battery powered lanterns available;

18) Install closed circuit television or CCTV to monitor areas where a bomb might be placed;
19) Install metal detecting devices;

20) Post signs indicating the use of closed circuit televisions and other detection devices;

21) Entrances and exits to and from buildings could possibly be modified to channel all personnel entering or leaving the building, by a registration desk.

8.2 PREPAREDNESS

a) Searching for bombs

Authorities are in agreement that the most effective and fastest search of a building can be made by the occupants of that building. Bombs can be packaged in as many different ways as the maker’s imagination will allow. Some devices may be in the size of a cigarette package, while others may be as large as a 2 ½ ton truck. Since the object of the search can vary in size and shape, it is fundamental rule that search must be made by persons who are familiar with the area in order to notice a strange or foreign object.

The following search techniques must be employed:

1. A staff member or supervisor should be designated as floor or area warden for each floor of the building perhaps several area wardens for single storey building. Wardens should be responsible for directing the search of their areas, receiving information from search personnel, and relaying it to the control center/ERT;

2. Alert the nearest medical facility or the PGH DEMS during the search process to provide the immediate medical attention in the event of accidental or premature detonation;

3. Alert police and fire department personnel in the event a detonation occurs;

4. Security, maintenance, and janitorial personnel will conduct a thorough inspection of the following areas: hallways, utility closets, and other vital areas within the vicinity of the building; Office staff should search their immediate areas;

After a thorough search of the whole building and no suspicious objects were found, it is important that a report be submitted to the appropriate floor warden/ERT.

8.2.1 When a suspicious object is located:

1.) It is imperative that personnel involved in the search be instructed that their mission is only to search for reported suspicious objects and NOT to move, jar or touch the objects or anything attached thereto. The removal/disarming of a bomb must be left to the professional bomb technicians;

2.) The location and a description of the object as can best be provided
should be reported to the floor or area warden. The information should be relayed immediately to a colleague who will then call the person in charge of the control center or the ERT who will call the police, fire department and rescue squad. When these agencies arrive, they should be met and escorted to the scene;

3.) To minimize damage, sandbags or mattresses not metal plates may be around the object. **DO NOT ATTEMPT TO COVER THE OBJECT;**
The danger area should be identified, and cordoned off with a clear zone of at least 300 feet including areas below and above the object;

4.) Check to see that all doors and windows are open to minimize primary damage from the blast and secondary damage from fragmentation;

5.) Evacuate the building;

6.) Do not permit re-entry into the building until the device has been removed, disarmed, and the building has been declared safe for re-entry

**8.2.2 Communication During Search:**

1.) A rapid two-way communication system is of utmost importance. Communications between wardens, search teams and the control center can be accomplished through the existing telephone systems, or the building’s internal communication system;

2.) The use of **two-way radio is discouraged.** The radio beam could cause premature detonation of an electric initiator (blasting cap)

**8.2.3 Potential Concealment Areas:**

1.) Buildings and Structures
   - Elevator wells and shafts (caution: watch for strong winds in elevator shafts);
2.) Nooks, closets, storage rooms, false panels, walk areas, counterweights, motors, cables, trash in shafts, all ceiling areas, restrooms, access doors, crawl space in restrooms, areas used as access to plumbing fixtures, utility and other closet areas, electric fixtures, space under stairwell, boiler (furnace) rooms, flammable storage areas, main switches and valves, indoor trash receptacles, storage areas including record stage areas, mail rooms, ceiling lights with easy removable panels, fire hose tracks, basements, around windows hidden by drapes or shades, inside desks, inside storage cabinets and containers under the tables;
3.) Auditorium and Theaters. Search must be conducted under each seat, into cut seat cushion as well as the following
   - Stage area, microphones, speaker platform, crawl ways, tunnels, trapdoors, dressing rooms, restrooms, storage areas, ceilings, props, hanging
decorations, lighting fixtures, sound system, air – conditioning system, roof, heating system, projection booths, offices;
b. Schools. School bombings are usually directed against non – student areas;
c. Lockers, chemistry laboratories, cafeterias;
d. Outside areas: street drainage systems, manholes in street and sidewalks, garbage cans, dumpsters, incinerators, mailboxes, parked cars and carts, and trucks.

b) If you receive a telephone bomb threat
1.) Remain calm, be courteous, listen to and do not interrupt the caller;
2.) Get the attention of another person; hand off a note saying, : "Call the Police—bomb threat";
3.) If your phone has a caller ID display, record number of incoming call;
4.) Write down the exact words of the caller and threat;
5.) Don’t hang up the phone. Leave the line open;
6.) Notify a supervisor.

Use this Bomb Threat Checklist (see appendix 8.1) to record details from the call.

8.2.4 What To Do?

Whenever a bomb threat has been phoned-in, the recipient must signal co-workers to report the call immediately to the Security Office who must respond to the station that received the call while the call is in progress. Critical information must be written down immediately on the provided form.

a. Critical Information to note down:
   - Exact time of call
   - Exact words of caller

b. Questions to ask:
   - Where is the bomb located?
   - What time is the bomb set to detonate?
   - What is the description of the explosive?
   - What is the reason for the call or threat?

c. Note the caller's voice

1) Suspected Bomb Located
   a) Report immediately to the Security/ERT (Communication Team) or any duty guard/uniformed personnel on site
   b) Do not touch or move unknown objects
   c) A bomb search detail from each office who is more familiar with the office layout and its content shall assist, upon request of the EOD to facilitate the search of the suspected bomb

2) The SECURITY/COMMUNICATION TEAM shall:
a) Call immediate assistance from the nearest military/police office and Bureau of Fire Protection
b) Alert/Inform the Dean, Head of Unit, Chief Administrative Officer, Building Administrator, and Emergency Marshal
c) Turn off/request to turn off electrical/gas units Secure and cordon the area
d) Do not allow any person to get inside the building unless declared safe by the Bomb Disposal Team
e) The EOD and Security Team will inform the Dean or the Head of Unit to activate the ERT when there is valid threat;
f) Emergency Marshall or the Dean to activate the ERT (Code 5)

3) The EVACUATION TEAM:
   a) Evacuate personnel, occupants, visitors at least 300 ft away from the bomb (upon the advice of the EOD);
   b) Guide and assist colleagues to the Evacuation Area Mark doors with an X for cleared rooms

8.2.5 In Case of Premature Bomb Detonation
   1) Coordinate with the (EOD) Explosive Ordnance Disposal Unit to conduct post blast investigation;
   2) EOD will then conduct secondary or tertiary search in case there is a secondary device;
   3) Wait for the signal from EOD before conducting SAR.

8.3 BOMB THREAT/BOMBING INCIDENT

BOMB THREATS are delivered through any of the following:
1. Telephone/Mobile Phone
2. LetterBombs/Parcels
3. Car Bombs
4. Person to Person

8.3.1 Security and Safety Measures in case of Bomb Threats and Disposition of Bombs
a.1 Information, Identification and Detention
   a.1.1 Planted or left behind assembled bomb
      1. Strange, unusual and/or unattended baggage, bags, boxes and parcels
      2. Tightly wrapped and compact packages/parcels;
      3. Oily stains in the envelope or wrapping
      4. Ticking sound like that of the clock is being heard from the baggage, bag, box or parcel;
      5. Presence of electric wire, plastic cord and batteries in the baggage, bag, box or parcel
      6. Delivery of unexpected packages or parcel
   a.1.2 Letter or package bomb
      1. Strange or unusual
      2. Restrictive markings Misspelled words
      3. Addressed to the position title only
4. No return address
5. Rigid or bulky (clue to explosive content)
6. Oily stains on envelope or wrapping
7. Lopsided
8. Generic or incorrect titles
9. Any foreign writings, addresses or postage
10. Handwritten notes such as “To be opened in Private”, “CONFIDENTIAL”, “Your lucky day is here”. “Prize enclosed”, among others
11. Hand delivered or dropped off packages or letters for a friend
12. Any letter or package announced before or after a phone call from an unknown person asking if the item was received

a.1.3 Sophisticated, modified, improvised or intricately designed bomb
1. aluminum shell, 2 to 4 inches in length which looks like an umbrella rod
2. aluminum shell, 2 to 4 inches in length with noodle size wire that comes in pair
3. battery-operated alarm clock with poor workmanship in most cases protruding wires come in pair
4. black powder
5. oily stains smell like gasoline, petrol or diesel
6. small white beads like rice grains, light weight with poignant odor (urine-like odor) may be contained in bottles, boxes, can or plastic bags, oily when exposed to air
7. spaghetti-sized plastic cord in white, yellow, red, or orange color with filling inside
8. white grayish, white clay material which look like play dough contained in bottles, boxes, bags, or cigarette packs
9. Unused batteries for watches, calculators or nine-volt batteries
10. wire (noodle size in any color)
11. parked vehicles, either truck, car, motorcycle, bicycle or push carts appear left or unattended without driver or claimant
12. electronic device such as radio tape, cassette player, mobile phone, computer board or microprocessor circuitry, and the like

b.1 Procedures
b.1.1 Safety Precautions and Security Measures
a. DON'Ts
1. Do not panic
2. Do not touch any suspended incendiary device or bomb
3. Do not move or attempt to open suspicious or unattended packages
4. Do not receive any package bag, box, and parcel from the strangers
5. In case of actual explosion, do not tamper with the debris

b. DOs
1. Move at least 100 - 300 feet radius away from the bomb turn off electrical
and gas units if possible
2. Report immediately to the Building Administrator, Security/Communication Team or any duty guard/uniformed personnel on site

b.1.2 Dealing with Bomb Threats
a. The person receiving the call should:

1. Attempt to keep the caller on the line as long as possible and record the conversation, noting down and remembering the exact words of the person making the threat or ask the same person to repeat the message
2. Try to elicit where the bomb is, what it looks like, who placed the bomb or the time of possible detonation and the reasons
3. Note the time and duration of the call
4. Note the background noises and voice characteristics, male or female young or middle aged, tone or account

b. Upon receipt of the bomb threat, the person receiving the call should immediately notify the Chief Security Officer or duty officer or the Dean, Head of Unit, Administrative Officer

c.1 Bomb Exploded or Post-Blast Action
a. Only the Explosive Ordnance Decision (EOD) Team shall remove or disarm the bomb and conduct post blast investigation
b. Do not tamper with the debris
c. A bomb search detail from each office who is more familiar with the office layout and its content shall assist upon request of the EOD to facilitate the search of suspected bomb

c.1.1 The SECURITY COMMUNICATION shall:
  a. Call immediate assistance from the nearest military/police office and Bureau of Protection Fire, EOD
  b. Alert/Inform the Dean or Head of the Unit, Administrative Officer, Building Administrator, and Emergency Marshal
  c. Turn off/request to turn off electrical/gas units.
  d. Secure and cordon bombing scene
  e. Never allow any person to get inside the building unless declared safe by the Bomb Disposal Team
  f. Alert personnel for other possible bombs
  g. Assist in securing the Office or its periphery where suspected bomb is located
c.1.2 Emergency Marshal to activate ERT
c.1.3 The EVACUATION TEAM:
  a. Evacuate personnel, assistants, occupants, visitors at least 300 feet away from the bomb
  . Guide and assist colleagues to the Evacuation c.
  rea Mark doors with an X for cleared rooms
8.3.2 Evacuation Procedures For Explosives Related Emergencies

1. The First responder in the area or anyone who can handle the fire extinguisher shall exert all efforts to contain the fire.

2. At the sound of the alarm or issuance of order to evacuate, the Evacuation Team shall determine the safety exits, depending on the location of fire.

3. Simultaneously with the above, the Evacuation Team shall visit the different location (Offices, rooms, toilets and other rooms used) where there may be employees and other occupants who cannot hear the alarm. They shall look out for people who may become hysterical and may faint upon hearing the alarm, or those who may have heart disease. Such cases shall be transported or evacuated by the Search and Rescue Team. Evacuation Teams shall see to it that door/rooms are properly marked with “X” white chalk after search is done to save time.

4. Evacuation Teams shall then march at the end of their squats through the exit and then lead the march through the stairways and corridors in an orderly manner without crowding, at uniform speed, and with careful observance of spacing between files. They shall be especially watchful to prevent stumbling trampling or other conditions which could cause halting of march through the exit.

5. Security Team will cordon the area, man the perimeter and prevent unauthorized person’s from entering the premises.

6. Security Team in coordination with PNP Traffic Officers/MMDA shall ensure the free flow of traffic for passage of firemen and the evacuees/victims/injured in going to the evacuation area.

7. The First Aid Team shall administer necessary treatment and first aid to victims. Evacuation to hospital/s shall be determined by the Medical Group (Supreme Court Physician/Head Nurse) with the use of ambulance or vehicles provided by the Transport Team or any vehicle that will arrive willing to assist in transporting the victims to the nearest hospital.

8. Everyone shall remain at the Evacuation Area until further announcement from the Emergency Marshal.

9. The Evacuation Team shall account to ensure completeness of their Office’s personnel. In case of missing persons, he/she shall report the missing person/s to the Emergency Marshal.

10. The Emergency Marshal shall direct the Search and Rescue Team to search/locate and rescue missing persons.

11. The Logistics Team shall provide ERT materials when needed.
12. The Emergency Marshal shall make a full detailed report of the incident.

13. Releasing of information and other details when required by other person, especially the media, shall be courséd through the Public information office or the designated spokesperson of the University (Media Handlers Team).

8.3.3 Recovery
1. Prepare a post bomb threat or incident report. Emphasize on the critical events that took place with an analysis or in depth evaluation in order to update the administrators of necessary changes so that the contingency plan will be more responsive in case of another bomb threat;
2. During and immediately after a bomb threat incident, perimeter security personnel shall be advised to be on the lookout for unauthorized persons who may want to enter the building or premises. The bomb threat could be just a diversion;
3. As soon as the area is cleared by the EOD and approved by the Dean or Head of Unit, the Dean shall announce to the employees, students the resumption of classes and office work.

8.4 BOMB THREAT SITUATIONS

When dealing with bomb threats, the following situations must be considered:

8.4.1 Situation I – Bomb Threat Received
1. Person receiving the call should attempt to keep the caller on the line and record the conversation, noting them down and keeping in mind the exact words of the person making the threat (refer to the Checklist);
2. It is important to get the following details from the caller:
   a) Exact location of the bomb;
   b) Time set for detonation;
   c) Description of the explosive and/or its container;
   d) Reason or motivation for the bombing
3. Person receiving the call should notify the Administrative Officer and/or the Security Officer regarding the bomb threat. The security personnel shall then make an assessment if there is a valid threat and will report directly to the Dean or the Head of the Unit. If there is a valid threat, the Dean shall activate the Emergency Response Team and order an evacuation of all employees and students to a designated evacuation area;
4. The Security Officer shall then notify/call the nearest police station and then coordinate directly with Explosives Ordnance Division (EOD);
5. While waiting for the arrival of the EOD, the security personnel shall undertake the following:
   a) Coordinate with the Emergency Response Team (ERT) which was activated by the Dean;
   b) Secure all entry and exit points to prevent further entry of plotters. During the process, nobody except those in the security and emergency response team will be allowed entry to the building;
   c) Cordon the area and conduct a separate evacuation for guests for screening
6. If the decision of the Dean or the Head of Unit is to conduct search without evacuating the employees and students, the following announcement shall be made:

"Everybody is requested to check their respective areas for the presence of any suspicious items, packages, or materials. Do not touch any item under suspicion. Upon discovery, the Administrative Officer/Security Officer shall be notified"

7. The following shall be considered when evaluating if there is a valid threat:
   a) Record experience/history. Based on experience, over 95% of bomb threat, whether telephone or written is a hoax;
   b) Presence of compelling evidence. The preponderance of such evidence will dictate the decision to be taken;
   c) Whether the bomb is actually found or not, the safety of the students and employees are always paramount. As such, no bomb threat should be taken lightly.

8. Radio transceivers are not to be used in suspected areas. This can trigger premature explosion

8.4.2 Situation II – An Explosive Device or What Appears to be One is Found

If the bomb or what appears to be one is found before the arrival of the EOD, the following actions shall be undertaken by the security officer/personnel

1. Place furniture barriers or large mattresses around the bomb;
2. Never touch or retrieve the bomb package. Leave this job to the experts;
3. Open all doors and windows to lessen the damage from the bomb blast;
4. Assign a point person to guide the EOD to the location of the bomb upon their arrival. If possible, prepare a map with directions in order to locate the area

8.4.3 Situation III – Explosion without Warning

a. If the explosion results into fire, execute the emergency plan for fire;
b. Call the nearest fire department;
c. Call and prepare a detailed report to the EOD;
d. Provide assistance to the wounded persons if there be any;
e. Cordon off the affected area to prevent the people from loitering and obstructing access to the area;
f. All entry and exit points must be locked except for those evacuating the area;
g. Intensify access control measures within the affected area and premises. Secure the area to preserve the crime scene;
h. Establish and secure the properties within the affected area;
i. Secure evidence. Prevent people from destroying evidence intentionally or unintentionally;
j. Security personnel must assist in the evacuation of employees and students;
k. The Dean, EOD and the security personnel shall assess the situation
thoroughly and decide whether to declare suspension of classes and office work;

I. Be alert for any secondary explosion

REFERENCES:
1 Philippine bomb data center
2 Security and Safety Standard Operating Procedures Manual by Mr. Jason A. Domingo, RAD, National Bureau of Investigation
3 Internet : police.ucsf.edu
4 Bomb threat checklist from NPC, PNP, NCRPO, MPD
5 Supreme Court Manual
APPENDIX 8.1
BOMB THREAT CHECKLIST
PHILIPPINE BOMBB DATA CENTER
(Adopted by UP Manila/UP-PGH)

QUESTIONS TO ASK FOR BOMB THREATS:
1. When is the bomb going to explode?
2. Where did you put the bomb?
3. When did you put it there?
4. What does the bomb look like?
5. What kind of bomb is it?
6. What will make the bomb explode?
7. Did you place the bomb?
8. Why did you place the bomb?
9. What is your name?
10. Where are you?
11. What is your address?

EXACT WORDING OF THREAT

ACTION
REMEMBER TO KEEP CALM- DON’T HANG UP
Report call immediately to
Phone Number ___________________

CALLER’S VOICE
Accent (specify):
Any impediment (specify):
Voice (loud, soft, etc.):
Speech (fast, slow, etc.):
Diction (clear, Muffled, etc.):
Manner (calm, emotional, etc.);
Did you recognize the voice?
If so, who do you think it was?

THREAT LANGUAGE
Well spoken:
Incoherent:
Irrational:
Taped:
Message read by caller:
Abusive:
Other:

BACKGROUND NOISES
Street noises:
House:
Aircraft:
Voices:
Local:
Music:
Long Distance:
Machinery
STD:
Other:

OTHER INFORMATION
Sex of the caller:
Estimated Age:

CALL TAKEN
Date: __/__/____ Time: ______
Duration of Call: 

_________________________

Number Called: 

_________________________

**RECIPIENT**

Name: 

_________________________

Telephone Number: 

_________________________

Signature: 

_________________________
Chapter 9: Guidelines for Biological Hazard Spills / Contamination

Written by:
Prof. Marohren T. Altura
Assistant Professor
College of Public Health, UP Manila

9.1. RATIONALE

The University of the Philippines Manila, being The Health Sciences Center, and the Philippine General Hospital, as the teaching hospital of the UP System, maintains several biological laboratories. These laboratories may contain biological and microbiological agents, that when accidentally released in cases of man-made and natural disasters, may be hazardous to people, animals, plants and the environment.

The Philippines was listed in 2012 as the third most disaster-prone country in the world, due to its geographical location, in the “ring of fire” and typhoon-path of an annual average of 22 typhoons. Moreover, the country is preparing for the consequences of the next big earthquake, according to the Metropolitan Manila Earthquake Impact Reduction Study (MMEIRS). Aside from this, there are several man-made disasters, namely, consequences of terrorist/secessionist group activities in the country, Abu-Sayyaf, MNLF, NPA; training activities conducted in the country by the JI and the bin-Laden group. These groups may also utilize biological agents as weapons of mass destruction, these agents may be sourced from the laboratories which studies them or these may be obtained from the environment.

The University has to prepare for the eventuality of the release of these biological agents, whether accidental or intentional. In conjunction with the preparedness, there is also a need to control or secure the biological and chemical agents that are available in the University.

The following materials will discuss the terminologies used in biological agents /hazards, containment facilities (laboratories) and equipment, techniques and practices in safe handling, trainings as preparations (for preparedness), the procedures in containment of small and large-scale spills. Reporting and evaluation mechanisms of accidents and near-misses will also be covered in this manuscript.

9.2. EMERGENCY RESPONSE

In the event of accidents and near-misses in the biological and biomedical laboratories, the following standard emergency response procedures will be followed, unless a more detailed plan adapted to a particular research / laboratory had been specified in the Research’s / Laboratory’s Biosafety Manual. These procedures are also specified in the UP Manila's Guidelines on Biosafety and Biosecurity Manual.

9.2.1. Medical Emergencies

9.2.1.1. If contact with blood or other potentially infectious material occurs on skin with cuts, rashes, acne or dermatitis, wash the area for 15 minutes with soap and water.
9.2.1.2. If blood or other potentially infectious material splashes in the eyes or on mucous membranes, flush the area for 15 minutes with water or normal saline at an eyewash station. Remove contact lenses while flushing the eye.

9.2.1.3. If there is a cut or puncture with a contaminated object (broken glass, needle, etc), or bitten by a laboratory animal, wash the area for 15 minutes with soap and water.

9.2.1.4. Notify laboratory supervisor or principal investigator (PI).

9.2.2. Biohazard Spill

Most spills involving infectious agents and recombinant DNA materials can be effectively handled by researchers. A spill kit to properly clean a spill must be available in any lab that works with or stores biohazardous materials.

9.2.2.1. A spill kit must contain the following:

- An appropriate disinfectant which works against the agents of concern: e.g. microorganisms or human-derived materials. For clean-up of larger spills, alcohol is not recommended due to flammability concerns;
- Personal protective equipment (PPE) including a lab coat or gown, and gloves. A face shield and shoe covers may be required;
- Sharps containers for collection of broken glass;
- Absorbent material such as bench liners or paper towels;
- Tongs to pick up broken glass;
- Dust pan and small broom;
- Autoclave bags.

9.2.2.2. Clean-up procedure for minor spills:

Wipe up spill with a disinfectant-soaked paper towel and clean the surface with a suitable disinfectant.

9.2.2.3. Clean-up procedure for major spills outside the Biological Safety Cabinet (BSC), centrifuge, or other laboratory equipment:

9.2.2.3.1. Close off spill area to traffic, and notify coworkers.

9.2.2.3.2. If the spill may involve an aerosol, instruct all occupants to leave the room for 30 minutes to allow aerosols to settle. Aerosols can form if material is dropped. Place a sign on the door warning staff not to enter the room due to a spill.
9.2.2.3.3. Remove contaminated lab coat or clothing and wash exposed skin.

9.2.2.3.4. Put on clean gloves and lab coat.

9.2.2.3.5. Prepare enough volume of a 1:10 dilution of chlorine bleach or other approved disinfectant to saturate the contaminated area.

9.2.2.3.6. Contain the spill with paper towels or other absorbent material such as bench liners.

9.2.2.3.7. Flood the spill area with disinfectant. Leave on for 10 minutes.

9.2.2.3.8. Push the absorbent material at the edge of the spill into the spill's center. Add more paper towels as needed.

9.2.2.3.9. If glass is present, use tongs or forceps and a dustpan to remove pieces and place into a sharps container.

9.2.2.3.10. Discard the paper towels into a biohazard waste container.

9.2.2.3.11. Using clean paper towels and a disinfectant, wipe all surfaces that may have come in contact with the spilled material.

9.2.2.3.12. Discard gloves into biohazard waste container.

9.2.2.3.13. Wash hands thoroughly.

9.2.2.3.14. Autoclave an overtly contaminated lab coat prior to placing into laboratory laundry bag.

9.2.2.3.15. Notify Principal Investigator or Supervisor and the Biosafety Officer (BSO).

9.2.2.4. For major spills inside a Biological Safety Cabinet (BSC):

9.2.2.4.1. Leave BSC on.

9.2.2.4.2. Follow steps 9.2.2.3.2 through 9.2.2.3.10 indicated in the earlier procedure described. Do not use 70% ethanol as it evaporates too quickly to allow adequate surface contact time.

9.2.2.4.3. If the cabinet has a catch basin beneath the work surface and the spill resulted in liquids flowing into this area, more extensive decontamination is required.

9.2.2.4.4. Ensure the drain valve under the cabinet is closed.

9.2.2.4.5. Pour disinfectant onto the work surface and through the front and rear grilles into the drain pan. Allow 20-30 minutes contact time.
9.2.2.4.6. Absorb spilled fluid-disinfectant from work surface with paper towels and discard in biohazard bag.

9.2.2.4.7. Prepare to empty drain pan. Place fresh disinfectant solution in a collection vessel. Attach flexible tubing to the drain valve. The tube should be of sufficient length to allow the open end to be submerged in the collection vessel to minimize aerosol generation.

9.2.2.4.8. Open the drain valve and empty the drain pan into the collection vessel containing disinfectant. Flush the drain pan with water and remove the flexible tubing. Manage contaminated materials as if they are infectious.

9.2.2.4.9. Remove protective clothing used during cleanup and place in a biohazard bag for autoclaving.

9.2.2.4.10. Wash hands after gloves are removed.

9.2.2.4.11. Notify Principal Investigator or supervisor. Consult with BSO to determine if vapor/gas decontamination of the cabinet and filters is necessary.

9.2.2.4.12. Run BSC at least 10 minutes after cleanup, before resuming activity in the cabinet.

9.2.2.5. For major spills inside a centrifuge:

9.2.2.5.1. Spills or breakage of containers inside of an operating centrifuge pose a serious potential for exposure due to the creation of aerosols. If a primary container has broken in a centrifuge without a closed rotor or bucket, immediately suspend use, notify lab staff and PI and request assistance from the Biosafety Officer.

9.2.2.5.2. For suspected or confirmed spills/breakage in any centrifuge, wait at least 30 minutes after the centrifuge has stopped operating to initiate clean-up.

9.2.2.5.3. Put on lab coat, gloves and a face shield prior to opening centrifuge. Open carefully to assess the damage.

9.2.2.5.4. If the spill is contained within a closed cup, bucket or rotor, spray the exterior with disinfectant and allow at least 10 minutes of contact time. Remove the carrier to the nearest biosafety cabinet (BSC). If a biosafety cabinet is not available, close the centrifuge, post a sign to indicate it cannot be used. Notify the PI and Biosafety Office for assistance.

9.2.2.5.5. If a BSC is available, gather supplies needed, such as a sharps container for broken glass and bins filled with disinfectant and place into the BSC. Use forceps to remove broken glass and place directly into sharps container. Carefully remove any unbroken tubes and place into a bin filled with disinfectant for 20 minutes. Wipe carrier/bucket with disinfectant.
9.2.2.5.6 After disinfection, carrier, bucket or rotor should be washed with a mild soap and water.

9.2.2.5.7. Spray the interior of the centrifuge chamber with a disinfectant, let sit for 20 minutes and then wipe down.

9.2.2.5.8. Remove protective clothing and wash hands.

9.2.3. Reporting and Medical Treatment

9.2.3.1 If an injury is life-threatening, call the emergency hotline of PGH.

9.2.3.2 Report all exposures to your immediate supervisor and Principal Investigator.

9.2.3.3 Principal Investigators are responsible for reporting exposure incidents to the Institutional Biosafety Committee (IBC).

9.2.3.4 The IBC will perform a follow-up investigation of the incident.

9.3. BIOSAFETY AND BIOSECURITY ADVOCACY, TRAINING AND AWARENESS

Biosafety and biosecurity training, commensurate with the roles, responsibilities and authorities of staff, should be provided to all those working at a facility, including maintenance and cleaning personnel, and to external first-responders and responsible staff involved in ensuring safety and security of the laboratory facility. Training should help understand the need for biosafety and biosecurity and the rationale for the laboratory measures adopted.

Training should not be a one-time event. Training should be offered regularly and taken recurrently. It should represent an opportunity for employees to refresh their memories and to learn about new developments and advances. Training is also important in providing occasions for discussions and bonding among staff members, and in strengthening of the team spirit among members.

The essential topics to be covered during training shall be:

9.3.1. Introduction to biosafety and risk assessment, operational practices for biosafety

9.3.2. Operation and maintenance of the biosafety cabinet and other laboratory equipment

9.3.3. Blood-borne pathogens

9.3.4. Decontamination, waste management and disposal

9.3.5. Transport and shipment of infectious substances and biological specimens

9.3.6. Biosecurity in the laboratory
9.3.7. Spill and emergency procedures

9.3.8. Institutional Biosafety Committee (IBC) Guidelines in review and approval of research work

9.4. DEFINITIONS

**Biological hazards** – Hazards of biological origin, whether from living organisms, or non-living biological material, which may create a hazard to human health.

**Host** – a species that develops a level of infection with a parasite that can be accessed and transmitted further by a vector.

**Infectivity** – the ability of a pathogen to spread rapidly from one host to another.

**Microorganisms** – microscopic organisms, including bacteria, rickettsia, viruses, prions, protozoa and fungi.

**Parasites** – bacteria, viruses, protozoa, helminths or arthropods which are dependent upon a host for survival.

**Pathogen** – an agent that causes infection or disease, particularly a microorganism.

**Pathogenicity** – the capacity of a pathogen to produce disease.

**Vector** – a host species that acquires the parasite from an infected host and transmits it to another host.

**Virulence** – relative pathogenicity, a quantitative measure of the severity of the disease that a group or species of microorganism is capable of causing.

**Zoonoses** – diseases which can be passed from animals to humans, transmitted directly or via an intermediate host vector, but where the human host is not an essential part of the life cycle.

Reference

Chapter 10: GUIDELINES FOR RADIATION-RELATED DISASTERS

Written by:

Eliseo S. Dela Cruz, Jr., CMP
Health Physicist III/Radiation Safety Officer
Philippine General Hospital

10.1 RATIONALE FOR THE GUIDELINE

The University of the Philippines Manila campus includes the Philippine General Hospital (PGH), which is a tertiary hospital with radiation facilities. Bearing in mind the harmful effects of radiation to human beings, radiation protection should and always be employed. Radiation protection is universally defined in the WHO-International Atomic Energy Agency as a System of Dose Limitation, i.e., justification, optimization and dose limits.1

In the event of natural calamities (such as earthquakes, typhoons, floods) these may affect technological hazards, and radiological incidents may occur owing to the presence of radioactive materials in the hospital with varying risks.

In the event of Mass Casualty Incident (radioactive fall-out and terrorist-related “dirty” bombs or theft), many people who are contaminated or injured by radiation may be referred to the Philippine General Hospital.

It is therefore necessary to develop principles of emergency management and create a framework within the UP-Manila community to reduce vulnerability and cope with disasters. It also necessitates a response plan that contains coordination and integration of activities necessary to build, sustain, and improve the capacity to mitigate against, prepare for, respond to, and recover from radiological incidents in UP Manila as an educational and medical institution.

This plan outlines the procedures to be followed by UP Manila and Philippine General Hospital to respond to radiation-related disasters resulting from earthquake, typhoon, fall-out and terrorist-related incidents. The critical areas are the radiation facilities of PGH, namely, Teletherapy with Cobalt-60 sealed source, Nuclear Medicine with various radiopharmaceuticals and Low Dose Rate Brachytherapy with Cesium-137 sealed tube sources.

Table 10.1 below shows the various categories of radioactive materials based on Philippine Nuclear Research Institute Code PNRI Regulations Part 26. It can be noted that the PGH teletherapy facility with Cobalt-60 source is classified under Source Category 1 and has the highest radiation risk to the personnel and population at large in times of leakage and disasters.2
Table 10.1. Security Groups and Source Categorization from PNRI Code of PNRI Regulations (CPR) Part 26

<table>
<thead>
<tr>
<th>Security Group</th>
<th>Source Category</th>
<th>Activity Ratio (A/D)</th>
<th>Practices</th>
</tr>
</thead>
</table>
| A              | 1              | A/D > 1000           | Radioisotope thermoelectric generators (RTGs)  
                   |                 |                      | Irradiators  
                   |                 |                      | Teletherapy  
                   |                 |                      | Fixed multi-beam teletherapy (gamma knife) |
| B              | 2              | 1000 > A/D > 10      | Industrial radiography  
                   |                 |                      | High/medium dose rate brachytherapy |
| C              | 3              | 10 > A/D > 1         | Fixed industrial gauges (e.g. level, dredger, conveyor)  
                   |                 |                      | Well logging gauges |
| D              | 4              | 1 > A/D > 0.01       | Low dose rate brachytherapy (except eye plaques and permanent implants)  
                   |                 |                      | Industrial gauges that do not incorporate high activity sources (typically portable)  
                   |                 |                      | Bone densitometers  
                   |                 |                      | Static eliminators |
|                | 5              | 0.01 > A/D and A > Exempt | Low dose rate brachytherapy eye plaques and permanent implant sources  
                   |                 |                      | X ray fluorescence devices  
                   |                 |                      | Electron capture devices  
                   |                 |                      | Mossbauer Spectrometry sources  
                   |                 |                      | Positron Emission Tomography (PET) check sources |

10.2 GUIDELINES FOR DISASTER PREVENTION

The radiation facilities of PGH, namely, Teletherapy treatment room, nuclear medicine department and brachytherapy storage are locked and secured when not in use. Personnel Monitoring Devices and Personal/Respiratory Protective Equipment are available in the Department.

**Teletherapy**

- A programmable alarm system (radiation area monitor) is provided and activated at a pre-set radiation level.
To limit access, the doors are installed with double locks and electronic switches, motion detectors are mounted in the area, and a video surveillance is connected to the UP Manila Police Force. There are also available duress button switches fixed on the wall and by remote control to activate the alarm system.

This alarm is connected to a private security monitoring company designated by Department Of Energy, United States of America.

The machine has various fail safe measures to prevent accidental exposures.

A Radiation Safety Program is available in the Department of Radiology, Philippine General Hospital, this program ensures to limit the radiation risks to both staff and members of the public.

A Security Plan is also available in the Department of Radiology, Philippine General Hospital. This plan seeks to address the prevention of access to unauthorized personnel and contingency plans in any event of theft and misuse.

An Emergency Plan for local use is also available in the Department of Radiology, Philippine General Hospital. This plan is intended when radiation source do not automatically return to "OFF" position.

**Nuclear Medicine**

All the radioactive materials are kept in the hot laboratory room, a restricted area, which is equipped with a ventilation system to reduce radiation concentrations in air.

Corresponding Radiation Safety Program, Emergency and Decontamination procedures are available in the Section of Nuclear Medicine, Department of Medicine, Philippine General Hospital.

**Low Dose Rate Brachytherapy**

A storage room equipped with a lead safe for the radioactive sources has limited access.

Corresponding Radiation Safety Program and Emergency procedures for LDR Brachytherapy are available in the Department of Radiology, Philippines General Hospital.
Optimum and open communication lines with government disaster agencies/units (e.g. Philippine Nuclear Research Institute, National Bureau of Investigation and Department of Health, etc.) are recommended.

10.3 GUIDELINES FOR DISASTER PREPAREDNESS

10.3.1 UP-Manila and PGH Constituents

It is the responsibility of all employees to ensure that they are familiar with the contingency plans that apply to the workplace and to the work in which they are involved. Employees must also bring to the attention of the appropriate supervisor or manager any shortcomings in contingency plans that they identify, regardless of whether they would be directly affected by such shortcomings.

10.3.2 Training of Concerned Personnel

All the radiation workers shall undergo refresher courses on radiation protection every three years. This includes lectures and hands-on training on the following:

1. Basic concepts and terminology in radiation physics
2. Radiation detection and measurement
3. Biological effects of ionizing radiation and risk estimates
4. Safe ward procedures including nursing care and discharging of patients
5. Basic principles and practice of external beam radiation therapy
6. Medical exposure in Diagnostic Radiology, Radiotherapy and Nuclear Medicine
7. Diagnostic procedures in nuclear medicine
8. Radiation therapy using unsealed radionuclide sources
9. Emergency procedures with sealed and unsealed radionuclide sources
10. Basic principles and practice of brachytherapy
11. Principles of radiation protection
12. Personnel dose measurement and monitoring
13. Decontamination
14. Duties and responsibilities of the Radiation Safety Officer and Radiation Safety Committee
15. Current regulations and codes of safe practice
16. Storage, safe handling, and waste disposal of radioactive sources
17. Hands-on workshop

The staff and personnel of the Department of Radiology and Department of Medicine shall also be given yearly orientation and updates on their corresponding Radiation Safety Program, Radiation Security Plan and local Emergency Procedures.

Radiation-related emergency drills shall be conducted by the Radiation Safety Officer of the Department of Radiology and Department of Medicine twice a year.
10.3.3 Develop Contingency Plan

A contingency plan shall be made available in the Department of Radiology and in the Department of Medicine in case of radiological emergencies and to carry out such plans in emergency situations. The scope of the plan covers actions to be carried out in case of:

1. Accidental medical exposure of a patient
2. Accidental exposure of a worker
3. Accidental exposure of a member of the public
4. Radiation incidents

10.4 GUIDELINES FOR DISASTER RESPONSE

10.4.1 For Local radiation incidents

The Chairs of the Department Radiology and the Department of Medicine shall be the Incident Commander in case of a local radiation incident. The Radiation Safety Officer (RSO) shall make necessary recommendations and appropriate actions to control the incident.

In cases where the whole building (Teletherapy and Nuclear Medicine located at the Left and Right Central Block of the Philippine General Hospital, or Brachytherapy at Ground floor of the West Wing of the Cancer Institute) is involved, the PGH Medical Director shall be the Incident Commander.

10.4.2 Mass radiation incident

10.4.2.1 Coordination with Various Units of UP Manila and the Whole UP System

During mass radiation incident specifically “dirty bomb” explosions within the campus of UP-Manila, the UP Manila Chancellor shall be the Incident Commander. The Chancellor shall coordinate with the Deans, the PGH Medical Director, Radiation Safety Officers, Fire Marshalls and the UP-Manila Police Force.

If the mass radiation incident happens outside the campus, the UP President shall be the Incident Commander. The UP President shall coordinate with the National Disaster Risk Reduction and Management Council (NDRRMC), the Department of Health (DOH), the Philippine Nuclear Research Institute (PNRI), the National Bureau of Investigation (NBI), the Philippine National Police (PNP), or the Department of National Defence (DND) as the case may warrant.
The Philippine General Hospital may be used for the treatment of patients injured by radiation. In this regard, PGH shall be fully equipped with trained personnel, dose monitoring instruments, decontamination agents and treatment protocols of radiation injured patients.

10.4.2.2 Coordination with the Department of Health and the Philippine Nuclear Research Institute

The Department of Health may provide assistance in any of the following ways:

• designating Triage Centers throughout the city

• providing information to citizens via the media

• transporting potentially exposed individuals requiring medical attention to area hospitals like PGH

• requesting additional medical equipment from the national stockpile if required

• forwarding updated information to all concerned health care professionals (e.g., “blast faxes”).

The Philippine Nuclear Research Institute may provide assistance in any of the following ways:

• designating radiation-free shelters

• control of radiation hazards

• providing information to citizens via the media

• accumulation, transportation and disposal of radioactive wastes

• providing additional radiation monitoring equipment, decontaminating agents and personnel protective equipment

• forwarding updated information to health care professionals and police (e.g., “blast faxes”).

• requesting assistance from the World Health Organization through the International Atomic Energy Agency if needed
10.4.3 Communications

PGH as a healthcare facility shall initiate and implement its disaster response plan to ensure its operations in times of emergencies. Initial communication shall focus on the hospital’s internal response first, to be able to subsequently accommodate external demands during emergencies.

10.4.3.1 Mass Incident Communications

For better coordination between local hospitals and ambulance services during mass incidents, a dependable communication system shall be facilitated through the PGH Emergency Medical Service.

The following procedure should be followed:

• External agencies like NDRRMC, DND, DOH, PNRI, NBI, PNP will be notified at the direction of the health care facility’s incident commander (the UP Manila Chancellor or UP President) through the RSO’s recommendations.

• The person(s) who are assigned responsibility for these notifications will document the following information for each call and these records shall be forwarded to the Incident Commander.
  ▪ the date/time of the call
  ▪ the person(s) contacted
  ▪ the basic information communicated
  ▪ a summary of any response which is received

10.4.4 Facility Lockdown

A facility lockdown to secure and limit the number of entrances into PGH, may be necessary especially in a mass casualty incident involving a relatively large number of people.

This may include road entrances as well as staff and visitor entrances. In general, a lockdown will be implemented if it is felt that there is a risk that the unregulated arrival of persons seeking care from the community at large, will exceed the capabilities of the facility to safely deliver care.
The UP Manila Chancellor (the Incident Commander) in collaboration with the Department of Health and law enforcement agencies shall determine whether there is a need for a facility lockdown.

The Chief of the UP Manila Security shall be responsible for implementing and enforcing a facility lockdown and shall request assistance from local law enforcement agencies as needed.

Communication for internal and external distribution shall be directed by PGH Medical Director. Alternative sites for those seeking health care shall be included in these communications.

The authority for termination of a facility lockdown resides with the UP Manila Chancellor. The decision to terminate a lockdown shall be made only after consultation with appropriate health and disaster agencies.

**10.4.5 Establishment of Emergency Operations Center (EOC) at PGH**\(^8,9\)

At the discretion of the PGH Incident Commander, the facility Emergency Operations Center shall be activated.

Consideration shall be given to the necessity for the following measures:

- the notification of the local and government health departments, NDRRMC, NBI, local police, and/or medical emergency services and establishment of the type and scope of their support
- a facility lockdown (generally not a consideration for limited events)
- ventilation control procedures if outdoor threat exists
- the release of stable hospital patients who are not part of the event and/or the need to restrict admissions, as well as the transferring of victims to other facilities
- suggested medical supplies
- internal communications for staff, patients and/or visitors
- external communications with the media, other health care facilities and the community at large
- establishment of a decontamination area and procedures for decontamination of patients and the environment/equipment
•post-traumatic event counselling

Specific details of the above-mentioned measures are contained in Appendix 10.2.

Guidelines for Emergency Operations Center are contained in Appendix 10.3.

10.5 GUIDELINES FOR DISASTER RECOVERY/REHABILITATION

Through the supervision of the RSO’s of PGH and with the assistance of PNRI, the radiation protection trained employees shall clear all areas of any radiological contaminants, including the grounds of the UP Manila Campus.

The process of decontamination shall be repeated until a safe radiation level is achieved. Upon maintaining radiation levels to background readings, PNRI shall declare the place and areas safe for human presence and normal activities.

If in any case that decontamination is unachievable (i.e. massive radiation incidents, fallout, etc.), the President of the Philippines shall declare exclusion zones.

REFERENCES

2. Philippine Nuclear Research Institute Code PNRI Regulations Part 26
3. Revised Hand-out on Radiation Safety Program, Department of Radiology, Philippine General Hospital (revised 2012)
5. Hand-out on Emergency Plan, Department of Radiology, Philippine General Hospital (2001)
6. Hand-outs on Radiation Safety Program, Emergency and Decontamination procedures, Section of Nuclear Medicine, Department of Medicine, Philippine General Hospital
9. National Committee for Radiation Protection (USA) No. 143
Appendix 10.1

CONTACT PERSONS at PGH FOR RADIATION-RELATED EMERGENCIES

A. Internal Contacts:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Supervisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>PGH Director/Chancellor/Deans</td>
<td></td>
</tr>
<tr>
<td>Radiation Safety Officers</td>
<td>ELISEO DELA CRUZ, JR.</td>
<td>554 8400 local 3102/3117</td>
</tr>
<tr>
<td>Nuclear Medicine On-Call Technologist</td>
<td>LINDA DACANAY</td>
<td>554 8400 local 3503</td>
</tr>
<tr>
<td>Communications/HR/Public Relations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGH Medical Director</td>
<td>JERRY M. OBALDO, M.D.</td>
<td>554 8400 local 3503</td>
</tr>
<tr>
<td>Nuclear Medicine Physician</td>
<td>JOSELITO R. LEGASPI, M.D.</td>
<td>554 8400 local 3100</td>
</tr>
</tbody>
</table>

B. External Contacts:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Health</td>
<td>(24 hr) 651 7800</td>
</tr>
<tr>
<td>Philippine Nuclear Research Institute</td>
<td>(24 hr) 922 60 10-16</td>
</tr>
</tbody>
</table>
Appendix 10.2

Operative Measures for the Proposed Emergency Operations Center, PGH

Ventilation Control

• Upon direction of the PGH Incident Commander, the Plant Operations/Facilities Supervising Engineer will be contacted to consider shut down of the Heating, Ventilation, and Air Conditioning (HVAC) system in the affected area(s) or building(s) if any of the following conditions exist:

- OUTDOOR THREATS: A local law enforcement, NBI, PNP, PNRI or DOH or corresponding government agency has announced a known or suspected release of airborne radioactive material in the area, such as might occur in an off-site release of radioactive material from a nuclear power plant.
- Other conditions that are determined to involve a credible terrorist event.

Management of the Hospital’s Patient Census

• If the number or type of hospital beds may be inadequate for anticipated needs, plan to assess the readiness of hospital patients for discharge; specify what, if any, restriction will be needed for hospital admissions; determine if transfer of patients to other facilities will be necessary; and implement surge capacity plans.
  • The Nursing Supervisor and Patient Care Directors will be responsible for activating and coordinating this portion of the healthcare facility disaster plan.

Patient Management and Decontamination

Patients exposed to ionizing radiation may include those who have received either an external whole body exposure, internal uptake or who have been contaminated. The medical treatment of patients with significant injuries or medical conditions should always take precedence over decontamination procedures. Stabilization and resuscitation should take priority over decontamination. The government should establish decontamination center(s) for the majority of potentially contaminated patients not requiring resuscitation and stabilization.

Whether injuries are life threatening or not, attempt to question the patient. Questions should include:

- When did the incident occur?
1. Treatment of Patients Requiring Resuscitation and Stabilization:

   If injuries require resuscitation and stabilization, immediately treat in the Department Emergency Medical Service (DEMS) without regard to contamination. If possible, remove outer clothing and place clothing in a durable plastic bag with appropriate patient identifiers. If not, cover clothes to minimize contamination. Take care of wounds by irrigating, and covering to the best extent possible. Universal precautions and double gloving will protect DEMS staff from contamination. Survey hand and clothing with radiation survey meter and replace as necessary after each patient. If patient requires hospitalization, transfer to a clean gurney and wrap in a clean sheet. Provide containers for radioactive waste. Protect floor with covering if time permits. It may be desirable to designate a separate entrance for contaminated patients and transferring them to a clean gurney prior to entering the (DEMS).

   Samples taken from the patient such as blood or urine should be labelled with the patient’s name, date, time of collection and “Caution Radioactive Material” tape obtained from Nuclear Medicine or the Radiation Safety Office before leaving the (DEMS).

2. Treatment of Patients Suspected To Have Received a Large Dose of Radiation

   Events causing exposure to a large dose of radiation are rare. Events such as nuclear weapons detonation or nuclear reactor core accidents may cause acute radiation syndrome (ARS). Exposure to smaller sources of radiation, such as teletherapy or industrial gauging devices could, over time, cause ARS. Depending on the dose received and amount of body exposed, prodromal symptoms can occur from hours to weeks later.

   Based on the Chernobyl experience, a good predictor of survival is the time from exposure to vomiting. At Chernobyl, the majority of individuals surviving the event did NOT vomit within the first 2 hours post-exposure. This equated to an absorbed dose of approximately 4 Gy or less. Lymphocyte count can be used to...
determine doses only if the total dose has exceeded several Gy. Generally, if the lymphocytes have decreased by 50% AND are $< 1 \times 10^3 \text{uL}^{-1}$ within 24 to 48 hours post-incident and no other medical conditions could have caused this decrease, the patient has received a moderate absorbed dose of radiation. A confounder in using lymphocyte counts to gauge absorbed dose includes patients with severe burns and/or trauma will also result in decreased lymphocyte counts.

For those individuals thought to have received large absorbed doses of radiation, i.e., $>1$ Gy, prolonged medical surveillance will be necessary. Conduct an initial CBC and every six hours thereafter for at least 48 hours. It will also be necessary to treat the patient antibiotics to prevent infections. Short term cytokine therapy may be appropriate when the absorbed dose is low, i.e., $< 3$ Gy.

Absorbed doses in the range of 2 to 6 Gy are the most important for medical intervention. Individuals exposed to large absorbed doses of radiation $>2$ Gy may exhibit the following symptoms:

- Nausea
- Vomiting
- Fatigue
- Weakness
- Psychological stress

It should be noted that all of these symptoms could be related to the anxiety of the event and should not be automatically associated with potential radiation exposure or contamination.

3. Treatment of Patients Suspected To Be Contaminated NOT REQUIRING Resuscitation and Stabilization:

Initial planning strategies for the decontamination of patients should include:

- Number of patients to be decontaminated over a specified period of time
- Source of tepid water, e.g., portable shower, permanent shower, sprinklers
- Climate, e.g., winter conditions, hot and humid conditions, strong winds
- Location of wet decontamination facilities in association with the ED
- Treatment of ambulatory and non-ambulatory patients

In an incident involving radioactive material, all patients presenting to the health care facility and not requiring resuscitation and stabilization should be
considered contaminated until proven otherwise and wounds should be decontaminated prior to decontaminating intact skin. Wounds free of contamination should be covered with waterproof dressing to prevent cross-contamination. Patients who have no evidence of external contamination should be treated in a routine manner but patient specimens should be considered contaminated and labelled with the patient’s name, date, time of collection and “Caution Radioactive Material” tape.

The following measures should be implemented for patient(s) presenting to the healthcare facility not requiring resuscitation and stabilization but who may be contaminated with radioactive material. The medical treatment of patients should always take precedence over decontamination procedures. Every effort should be made to explain the decontamination process, equipment used, patient specimens taken and contamination precautions to the patient prior to the start of any decontamination procedure.

• The decontamination area should be established in an area that will not impede regular traffic destined to the DEMS. Only those individuals not requiring resuscitation and stabilization should be decontaminated prior to treatment. A ‘hot’ patient entrance to the decontamination area should be established as well as a post-decontamination ‘cold’ zone. The decontamination area should be large enough to accommodate men and women as well as non-ambulatory patients not requiring critical medical care. Ideally, each should be assigned to separate decontamination lines. Non-ambulatory staff will require specialized convenience through the decontamination area. An area to take patient vital signs as well as treat minor injuries should be set up in the cold zone.

• If radioactive contamination is suspected, the Operator will contact decontamination team members, the Radiation Safety Officer and the Nuclear Medicine Technologist-on-Call immediately.

• UP Manila Security shall assist in directing traffic to and around the decontamination area. They will also assist in directing the more critically injured to the DEMS.

• Decontamination team members should obtain Geiger Mueller (GM) meter from Radiation Safety Office, Nuclear Medicine or Radiation Oncology. Individuals familiar with the use of radiation instrumentation such as the Radiation Safety Officer, medical physicists or Nuclear Medicine staff should be consulted. Perform a battery check and determine if the instrument is functioning properly by using an embedded
check source or a nuclear medicine dose. Cover probe with latex or nitrile glove to prevent contamination.
• Clearly identify triage and decontamination stations. Use radiation instrumentation such as a GM meter to screen for the presence of radiation which will allow separation of non-contaminated patients, which can be treated in the usual manner, from those requiring decontamination. Radiation screening devices such as portal monitors used to screen healthcare facility waste are attractive in attempting to deal with large numbers of potentially contaminated individuals. However, as of January 2006, no national manufacturing standard had been established for portal monitors. In addition, many existing portal monitors are not wide enough to accommodate wheelchairs or gurneys and all require periodic calibration and testing.
• The decontamination area should be clearly identified either with highly visible tape or traffic cones. No personnel are to enter this zone without first donning the appropriate level of personal protective equipment (PPE), e.g., PAPR, gloves, and boots. All individuals shall have received appropriate training and medical screening necessary for using PPE). Protective clothing will also stop alpha and some beta particles.
• If individual is contaminated or potentially contaminated, remove outer clothing. This eliminates 70 to 90% of the contamination. Careful removal of contaminated clothing and decontamination of patients minimizes the potential for personnel contamination. Use privacy screens. If screens are not available, use bed sheets. Bag, label and hold contaminated clothing and other contaminated items for Radiation Safety Officer. The bag should be clearly marked ‘Do Not Discard’. Provide a secure area to store the bagged articles.
• After outer clothing has been removed, instruct person to stand straight, feet slightly spread, arms extended with palms up and fingers straight out. Start at the top of the head and work downward. Pay particular attention to the hands. Scan slowly (about several inches per second) within an inch or so of the person’s skin. Be careful not to touch the probe to potentially contaminated surfaces. Monitor carefully the forehead, nose, mouth, neckline, torso, knees and ankles. Repeat this technique with the back of the body. Monitor soles of the feet. Decontaminate individuals using soap and tepid water. Do NOT scrub aggressively or use a hard bristled brush. This will potentially allow radioactive contamination to be absorbed through the skin. Thermal
burns should NOT be scrubbed due to the danger of hypothermia and hypotension and further risk of injury to the skin.

Scrubbing abrades and removes marginally viable skin, increases blood flow to the affected area and can increase dermal absorption of contaminants.

Only gentle rinsing should be employed. Potentially harmful practices, such as bathing patients with bleach solutions are unnecessary and should be avoided. Clean water, saline solution or commercial ophthalmic solutions are recommended for rinsing the eyes. Contamination found in the hair and not easily removed should be cut with a scissors. Instruct the patients NOT to swallow any water. Decontamination should be performed until removable contamination is less than several times background (for a GM meter with pancake probe, this would be approximately 200-300cpm) or until no more contamination can be removed. Isolate and cover any area of the skin that is still above background. Periodically check the background level of radiation in an area. Elevated background levels can occur if the radiation detection instrument becomes contaminated or if radioactive material is accumulating in the scanning area.

• Decontamination should be performed with the following priorities:
  - Wounds
    Contaminated wounds are first draped, preferably with a waterproof material to limit the spread of radioactivity. Contaminated wounds are to be cleaned by gentle scrubbing with a surgical sponge and irrigation. If area still has a highly elevated count rate, conventional debridement of the wound must be considered but only after consultation with medical staff with expertise in radiation wound management, e.g., REAC/TS. Remove contaminated drapes, dressings, etc., and monitor with GM meter probe covered with latex or nitrile glove. Place in a bag and label bag as radioactive.
    - Orifices
      Contaminated body orifices, such as the mouth, nose, eyes and ears need special attention because of possible rapid absorption. If time permits, use moistened swabs and collect a sample of each orifice separately. Bag (e.g. in a labelled “zip-lock baggie”) separately and save for assay for internal contamination. Generally, it is estimated that nasal swab activity represents approximately 5% of lung deposition. If radioactive material has entered the oral cavity, encourage brushing the teeth with toothpaste and frequent rinsing of the mouth. Instruct the patient
NOT to swallow. If the pharyngeal region is also contaminated, gargling with a 3% hydrogen peroxide solution might be helpful.

Contaminated eyes should be rinsed by directing a stream of water or ophthalmic solution from the inner canthus to the outer canthus of the eye while avoiding contamination of the nasolacrimal duct. Contaminated ears require external rinsing and an ear syringe can be used to rinse the auditory canal provided the tympanic membrane is intact.

-Skin decontamination

Complete decontamination is usually not possible because some radioactive material remains fixed to the skin. Decontamination to twice background levels is usually sufficient. Decontamination should be stopped if no further decrease is noted. Remember to assess the background radiation level before the contaminated patient arrives.

Ensure the radioactive contamination results, usually in counts per minute (cpm), identified at the various locations on the body, are recorded in the patient’s chart.

• Periodically check the background level of radiation in an area. Elevated background levels can occur if the radiation detection instrument becomes contaminated or if radioactive material is accumulating in the scanning area.
• Decontamination team members of other personnel with specialized radiation safety expertise should survey all personnel leaving the hot zone with a GM meter with special emphasis on the hands and feet.
• All staff involved with patient triage or decontamination should wash their hands thoroughly before leaving the area.

“Worried Well”

In an MCI event, a number of individuals reporting to the health care facility will likely be absent of any clinical symptoms of acute exposure to radiation. Many will present before more seriously injured victims appear at the health care facility. For this reason, effective disaster response plans including triage procedures must be in place prior to an event.

In many cases involving a radiation incident, members of the general public may request antibiotic, vaccines or radiation protectants such as potassium iodide (KI) from their physicians. Giving antibiotics to otherwise “well” patients may reduce the supply to patients who actually need the medications. KI is a specific agent intended to reduce internal uptake of radioiodine but is NOT a general ‘antidote for radiation’. A list of drugs which can reduce either uptake or absorbed dose can be found in the next item.
Patients Later Found To Be Exposed or Contaminated

In a situation where patients have been treated in the DEMS, released and later found to have been exposed to either external radiation or may have been contaminated, the Radiation Safety Officer should be immediately notified. If contamination is suspected, the Radiation Safety Officer will survey all areas known to have been visited by the patient and perform any necessary decontamination. If it is determined a discharged patient may have been exposed to a large dose of radiation prior to their arrival at the hospital, a physician familiar with the biological effects of radiation should contact the patient’s primary care physician to discuss possible long term effects and follow-up.

Radiation Protectants (Currently Approved by FDA as of March 2006)

If internal uptake is suspected, several options are available to limit internal uptake. These medications should not be taken without consultation with physicians familiar with their usage.

Limit Uptake
Radiiodines, e.g., $^{131}$I, $^{134}$I, $^{125}$I

For suspected radioiodine internal uptake, prescribe KI if within 12 hours. Tablets of KI are available over-the-counter. 130 mg of KI (65 mg for infants) effectively blocks 100% of the thyroid uptake of radioiodine if given prior to the event. KI given 4 hours post-uptake minimizes thyroid uptake by approximately 50%. KI given 12 hours post-uptake has little effect. Contraindications include individuals allergic to iodine. KI should not be given to individuals with dermatitis herpetiformis and hypocomplementemic vasculitis. Individuals with multi-nodular goiter, Graves’ disease, and autoimmune thyroiditis should be treated with caution especially if dosing extends beyond a few days. Unless extreme conditions warrant, repeat dosing with KI is not recommended for pregnant females and neonates. KI does not protect organs other than the thyroid.

Radiocesium, e.g., $^{137}$Cs, $^{134}$Cs
Radiothallium, e.g., $^{204}$Tl, $^{201}$Tl

Insoluble Prussian Blue, sold by HeylChemisch-pharmazeutische Fabrik GmbH under the trade name, Radiogardase-Cs, enhances excretion of isotopes of Cesium and Thallium from the body by means of ion exchange. It was approved by the FDA in 2003 for oral administration to treat internal Cesium and Thallium contamination. Orally administered Prussian Blue traps Cesium and thallium in the gut, interrupts its resorption from the GI tract and thereby increases fecal excretion.

It reduces the effective half-life of the material in the body by approximately 50%. It is still effective if given several days after
intake. The prescribed dose will depend on the level of suspected internal contamination. All administrations should be TID. This drug is effective only if GI motility is intact. Concomitant administration of tetracycline may retard absorption of Prussian Blue.

Pregnant and lactating women are able to tolerate this compound. Because potassium, chemically similar to Cesium, could also be absorbed, electrolyte levels should also be monitored.

Transuranic Elements, i.e., Plutonium, Americium, Californium and Curium

Recently the FDA approved the use of Ca-DTPA and Zn-DTPA for the treatment of internal contamination by plutonium, americium, californium and curium transuranic soluble salts. DTPA is a chelating agent and exchanges either calcium or zinc for another metal with greater binding ability and carries it to the kidneys where it is excreted in the urine. The chelating efficacy is greatest immediately, or within one hour, following uptake when the radionuclide is circulating in or available to tissue fluids and plasma. Ca-DTPA is approximately 10 times more effective within the first 24 hours than Zn-DTPA for chelation of transuranics and therefore should be used whenever larger body burdens are expected. However, after 24 hours, Zn-DTPA is as effective as Ca-DTPA and should be used for protracted therapy because of its lesser toxicity. Zn-DTPA is recommended for sensitive populations such as children, pregnant women, and patients with known kidney disease or bone marrow suppression. Ca-DTPA or Zn-DTPA should be administered either by slow intravenous push over a period of 3 to 4 minutes; intravenous infusion or inhalation in a nebulizer.

Follow-up and additional therapy may be continued for years if necessary. DTPA chelating agents are manufactured by Hamelin Pharmaceuticals in Germany. DTPA should not be used for uranium or neptunium internal uptake.

Strontium

Over-the-counter antacids reduce gastrointestinal absorption of strontium. Aluminum containing antacids are the most effective, reducing strontium uptake by 50 to 85%.

Uranium

Generally, uranium presents a greater chemical than radiologic hazard. Alkalize the patient with sodium bicarbonate in order to promote excretion. Alkaline urine forms a non-toxic uranium carbonate complex that is promptly excreted through the kidneys. Important factors in determining the effectiveness of this
method include the chemical form and particle size of the inhaled uranium.

Sodium bicarbonate should be administered either orally or intravenously.

**Required Supplies**

Suggested supplies needed inside the health care facility to treat potentially contaminated or patients receiving large absorbed doses include:

- Gowns
- Surgical scrub suits
- Surgical masks
- Surgical caps
- Disposable shoe covers
- Double non-sterile gloves with outer glove removed after each contact
- Disposable non-sterile gloves or Saran Wrap to cover and protect instruments
- Absorbent paper to cover the floor (may not be feasible for large scale event)
- Adhesive tape
- Personal dosimeters (electronic is best) for staff frequently in contact with contaminated patients
- Multiple portable survey instruments such as GM meters. Instruments should be properly calibrated
- KI tablets
- CBC tubes (purple tops which contain EDTA preservative)
- Filter paper, swabs and collection tubes
- “Caution Radioactive Material” tape

**Communication – Medical Staff and Patients**

Communication provided to the staff should be frequent and accurate. Address fear of radiation and contamination concerns. Anxiety symptoms include vomiting, diarrhea, nausea and headaches – the same symptoms caused by acute radiation exposure.

Patient information should include accurate information on the acute and long term health consequences of radiation exposure and should be included in the discharge instructions.

Fact sheets and Q&A sheets could also be given to patients. Fact sheets should include subject matter expert contacts and reliable sources of information. The information should be brief and easy to understand.

Following an incident or drill, conduct a tiered critique (physician staff separate from allied staff separate from housekeeping etc.) and report findings to the hospital board or other appropriate committee or group.
In the event of a radiation incident, the following actions should be followed:

• The Incident Commander will develop appropriate and timely communications for hospital and clinic staff, community medical staff, patients, visitors, the media and the community at large.

• Consider whether a Media Center, preferably located outside of the facility, should be established. Multiple power, telephone and computer lines as well as fax capability will be required in the Media Center.

• Consider establishing staff and visitor telephone communication lines. These lines should be updated frequently with estimates given for the next update. Patient lists should be maintained for inquiring family members. This information should also be coordinated with the local county health officials.

• All communications will be reviewed and approved by Incident Commander prior to distribution.

Laboratory Support

Specimens recommended to be collected by REAC/TS in a radiological event include blood, urine, feces, nasal and saliva swabs, sputum, vomitus and wound secretions. All specimens should be considered radioactive until proven otherwise. Differential complete blood counts (CBCs), taken over several days, are used to establish baseline and assess radiation dose received. If acute radiation syndrome is possible, CBC’s should be repeated every 6 hours for about 48 hours. Hospitals should identify, during planning, government agencies or labs able to receive samples for analysis. Often, Nuclear Medicine departments shall have thyroid probes with NaI gamma spectroscopy capability and research sites will have liquid scintillation detectors that can be used for beta and low energy gamma detection. The use of these instruments for quantitative analysis however is limited by proper calibration for the various source counting configurations.

Training

Video demonstrations include:

• Dressing to prevent the spread of radioactive contamination
• Preparing a patient treatment area
• Removing contaminated clothing
• Surveying for radioactive contamination
• Decontaminating a wound
• Decontaminating intact skin

At a minimum, DEMS and Primary Care physicians and DEMS staff should receive awareness level training in the above listed topics. Updated information will be provided through the Radiation Safety Officer.

Occupational Safety & Health Administration (OSHA) requires Operations level training for personnel expected to treat, triage or
decontaminate victims or handle victims before they have been completely decontaminated. This training must be 8 hours in duration and health care organizations must document on how these requirements are met. Annual refresher training is also required.

The CDC website has training material for DES staff. Also, the Health Physics Society Medical Response website has PowerPoint presentations that can be used for hospital staff training.

**Post-Mortem Considerations**

All autopsies involving victims of potential terrorist events will be referred to the Medical Examiner for examination; they will not be performed on site. Funeral directors will be provided safe handling instructions, as indicated by the diagnosis/suspected disease for these bodies by the Pathology Department in cooperation with Infection Control or Radiation Safety.

**Post-Traumatic Event Counselling**

Radiation counselling should be conducted in the presence of the Radiation Safety Officer or board certified physicists as well as trained counsellors. Possible discussion items should include:

- Short term acute effects
- Long term cancer risks
- Genetic risks
- Fetal risks

Most people will exhibit higher levels of anxiety rather than psychotic behavior. Some will also experience Post Traumatic Stress Disorder. Long term psychological effects could start arising 48 to 72 hours after the incident and continue for several months. Be proactive in reassurance and communication to reduce psychological issues. Information should be consistent with fact sheets and other information distributed to patients.
Appendix 10.3
Guidelines for the Emergency Operations Center

Section 1

Estimated Threshold Absorbed Doses for Deterministic Radiation Effects Following an Acute Exposure To Low-LET Radiation (adopted from NCRP 138, Table 4.1)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Critical Organ</th>
<th>Threshold Dose, Gy</th>
<th>Time Until Expression of Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary sterility</td>
<td>Testis</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td></td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Depression of blood cell forming process</td>
<td>Bone marrow</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Cataracts</td>
<td>Lens of eye</td>
<td>2.0 for single dose</td>
<td>8 yrs. (2.5 to 6.5Gy)</td>
</tr>
<tr>
<td>Early skin erythema (temporary)</td>
<td>Skin</td>
<td>2.0</td>
<td>2 to 24 hours</td>
</tr>
<tr>
<td>Permanent sterility</td>
<td>Ovaries</td>
<td>2.5 to 6</td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td></td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Epilation (temporary)</td>
<td>Skin</td>
<td>3 to 5</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Permanent sterility</td>
<td>Testis</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Main erythema</td>
<td>Skin</td>
<td>6</td>
<td>10 days</td>
</tr>
<tr>
<td>Epilation (permanent)</td>
<td>Skin</td>
<td>6 to 7</td>
<td>3 weeks</td>
</tr>
</tbody>
</table>
Appendix 10.3

Guidelines for the Emergency Operations Center

Section 2

Patient Specimens To Be Collected In a Radiation Incident (ORAU REAC/TS)
FOR ALL SUSPECTED RADIATION CASES

Samples Needed Rationale Collection Methodology

CBC and differential STAT followed with absolute lymphocyte counts every 6 hours for 48 hours when history indicates possibility of whole body irradiation. These are needed to assess dose. Initial counts establish a baseline, subsequent counts reflect the degree of injury.

Choose non-contaminated area for venipuncture. Verify using GM meter. Cover site after collection. Routine urinalysis to determine if kidneys are functioning normally and to establish a baseline of urinary constituents (especially important if internal contamination is likely).

Collect in urine container labeled with patient name, date and time. Wear gloves and avoid contaminating specimen during collection.

FOR EXTERNALLY CONTAMINATED RADIATION CASES

- Samples Needed Rationale Collection Methodology
- Swabs from body orifices Assess possibility of internal contamination.
- Use separate saline- or water-moistened swabs to wipe nostrils, ears mouth, etc.
- Wound dressings. (determine if wounds are contaminated.)
## Appendix 10.3

### Guidelines for the Emergency Operations Center

#### Section 3

**Estimated Threshold Absorbed Doses for Deterministic Radiation Effects Following an Acute Exposure To Low-LET Radiation** (adopted from NCRP 138, Table 4.1)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Critical Organ</th>
<th>Threshold Dose, Gy</th>
<th>Time Until Expression of Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary sterility</td>
<td>Testis</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td></td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Depression of blood cell forming process</td>
<td>Bone marrow</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Cataracts</td>
<td>Lens of eye</td>
<td>2.0 for single dose</td>
<td>8 yrs (2.5 to 6.5Gy)</td>
</tr>
<tr>
<td>Early skin erythema (temporary)</td>
<td>Skin</td>
<td>2.0</td>
<td>2 to 24 hours</td>
</tr>
<tr>
<td>Permanent sterility</td>
<td>Ovaries</td>
<td>2.5 to 6</td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td></td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Epilation (temporary)</td>
<td>Skin</td>
<td>3 to 5</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Permanent sterility</td>
<td>Testis</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Main erythema</td>
<td>Skin</td>
<td>6</td>
<td>10 days</td>
</tr>
<tr>
<td>Epilation (permanent)</td>
<td>Skin</td>
<td>6 to 7</td>
<td>3 weeks</td>
</tr>
</tbody>
</table>
Appendix 10.3
Guidelines for the Emergency Operations Center

Section 4

Effects of Large Acute Doses of Radiation

<table>
<thead>
<tr>
<th>Acute Dose, Gy*</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3 to 4.0</td>
<td>Whole body dose lethal to 50% of individuals within 60 days of exposure with minimal supportive care</td>
</tr>
<tr>
<td>6 to 7</td>
<td>Whole body dose lethal to 50% of individuals within 60 days of exposure with supportive medical treatment</td>
</tr>
</tbody>
</table>
| 2 to 8          | Loss of blood-forming stem cells  
Symptoms: chills, ulceration of the mouth, hair loss  
Death may occur several weeks after exposure from larger doses |
| 8 to 30         | Loss of GI mucosal stem cells  
Symptoms: bloody diarrhea, severe nausea, vomiting  
Death occurs in a number of days to several weeks |
| >30             | Cascading collapse of a number of systems required to sustain life  
Symptoms: nausea and vomiting within minutes, disorientation, loss of muscular movement, cardiovascular shock  
Death occurs in hours to days |

* Dose is approximate and symptoms will vary from individual to individual
Appendix 10.3

Guidelines for the Emergency Operations Center

Section 5

Ranges for Significant Effects from Nuclear Explosion (NCRP 138 Table 3.7)

<table>
<thead>
<tr>
<th>Yield K,T</th>
<th>Range of 50% Mortality from Air Blast m</th>
<th>Range for 50% Mortality from Thermal Burns m</th>
<th>Range for 4 Gy Initial Nuclear Radiation m</th>
<th>Range for 4 Gy Fallout in First Hour After Blast* m</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>60</td>
<td>60</td>
<td>250</td>
<td>1,270</td>
</tr>
<tr>
<td>0.1</td>
<td>130</td>
<td>200</td>
<td>460</td>
<td>2,750</td>
</tr>
<tr>
<td>1.0</td>
<td>275</td>
<td>610</td>
<td>790</td>
<td>5,500</td>
</tr>
<tr>
<td>10.0</td>
<td>590</td>
<td>800</td>
<td>1,200</td>
<td>9,600</td>
</tr>
</tbody>
</table>

*Note: Fallout depends on such factors as air or ground burst, wind speed, precipitation

Appendix 10.3

Guidelines for the Emergency Operations Center

Section 6

Lymphocyte Count in Humans at 24 to 48 Hours Post Exposure to Radiation (NCRP 138 Table 4.3)

<table>
<thead>
<tr>
<th>Lymphocyte Count (10^3µL^-1)*</th>
<th>Absorbed Dose (Gy)</th>
<th>Lethality Without Medical Treatment (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0 to 0.25</td>
<td>Minimal</td>
</tr>
<tr>
<td>1.2 to 2</td>
<td>1 to 2</td>
<td>&lt;5</td>
</tr>
<tr>
<td>0.4 to 1.2</td>
<td>2 to 3.5</td>
<td>&lt;50</td>
</tr>
<tr>
<td>0.1 to 1.2</td>
<td>3.5 to 5</td>
<td>50 to 99</td>
</tr>
<tr>
<td>0 to 0.1</td>
<td>&gt; 5.5</td>
<td>599-100</td>
</tr>
</tbody>
</table>

*Note: Patients with severe burns and/or trauma to one or more systems will experience decreased lymphocytes in the absence of acute radiation exposure.
Appendix 10.3

Guidelines for the Emergency Operations Center

Section 7

Sources of Radiation (adopted from ACR, 2005)

*Naturally Occurring Radioactive Material (NORM)* – typically <1% of any element occurs naturally as radioactive; may cause harm if concentrated

Ex – \(^{226}\text{Ra}, ^{40}\text{K}, ^{210}\text{Pb}, ^{234}\text{U}, ^{235}\text{U}, ^{238}\text{U}\)

*Nuclear Fuel Cycle* – the series of steps through which nuclear fuel passes
- Mining and Milling
  - e.g., \(^{235}\text{U}\) and its radioactive decay products; \(^{238}\text{U}\) and its radioactive decay products; \(^{222}\text{Rn}\)
- Conversion
  - e.g., same as above
- Enrichment
  - e.g., enriched \(^{235}\text{U}\) and its radioactive decay products; depleted \(^{238}\text{U}\) waste
- Fuel Fabrication
  - e.g., \(^{235}\text{U}\) and its radioactive decay products; \(^{238}\text{U}\) and its radioactive decay products; \(^{222}\text{Rn}\) and its radioactive decay products; isotopes of Pu
- By-products of nuclear power generation
  - Isotopes from above processes plus fission products
  - Fission products include:
    - Gases \(^{3}\text{H}; ^{82}\text{Kr}\) isotopes; \(^{86}\text{Xe}\) isotopes
    - Solids \(^{88}\text{Rb}; ^{89}\text{Sr}\) isotopes, \(^{137}\text{I}\) isotopes; \(^{133}\text{Cs}\) isotopes; neutron activation products (\(^{51}\text{Cr}, ^{55}\text{Mn}, ^{54}\text{Co}, ^{55}\text{Mg}\) isotopes, \(^{41}\text{Ar}\))

*Isotopes Used in Medicine*

- Nuclear Medicine – Most often involves small quantities of liquid or capsular radiation, i.e., < 1.1 GBq (30 mCi), used for diagnostic exams. Could also include therapeutic quantities of radioactive material, i.e., > 3.7 GBq (100 mCi), used to treat cancer.
  - e.g., \(^{99m}\text{Tc}, ^{131}\text{I}, ^{201}\text{TI}\)
- Radiation Oncology – Sealed sources of radiation used to treat cancer. Tend to be larger activity sources, i.e., 370 MBq to greater than 37 TBq (10 mCi to 1000’s of curies), and therefore, are of greater concern.
  - e.g., \(^{60}\text{Co}, ^{137}\text{Cs}, ^{192}\text{Ir}, ^{125}\text{I}, ^{103}\text{Pd}\)
- Biomedical research – Small quantities of liquid radioactive material are commonly used as biomarkers in research. Documented cases have occurred where individuals have introduced this material into co-workers’ foodstuffs. Involves small activity, typically liquid, sources, i.e., <370 MBq (10 mCi).
  - e.g., \(^{14}\text{C}, ^{3}\text{H}, ^{125}\text{I}, ^{32}\text{P}, ^{35}\text{S}, ^{51}\text{Cr}, ^{33}\text{P}\)
Sources Used In Military

- Projectile rounds – depleted U,³H
- Luminous paint –¹⁴⁷Pm,²⁲⁶Ra
- Soil density monitor –²⁴¹Am,¹³⁷Cs
- Chemical agent monitor –²⁴¹Am,⁶³Ni

Sources Used in Industry

- Exit signs –³H (up to 777 GBq (21 Ci) each)
- Specimen dating –¹⁴C – small quantities, i.e., < 37 MBq (1 mCi)
- Smoke detectors –²⁴¹Am – small quantities, 37 kBq (1 µCi) per device
- Industrial radiography –¹⁹²Ir,⁶⁰Co – device contains relatively large quantities of sealed sources of radiation; 0.2 to 7.4 TBq (5-200 Ci).
- Food irradiation and sterilization –⁶⁰Co,¹⁹²Ir – large quantity sealed sources of radiation; up to 10’s to hundreds of TBq (1000’s of curies).
- Gauges –²⁴¹Am,¹³⁷Cs,⁶⁰Co,³⁰Sr – sealed sources of radiation
- Neutron Soil Density Monitor –²⁴¹Am/Be – sealed sources of radiation; up through 1 GBq (10’s of mCi’s).
- Well Logging Devices –¹³⁷Cs,²⁴¹Am - sealed sources of radiation; 37 to 850 GBq (1 to 23 Ci)
## Appendix 10.3

### Guidelines for the Emergency Operations Center

#### Section 8

### Radiation Detection Instrumentation for Healthcare Facility Responders

<table>
<thead>
<tr>
<th>Detector Type</th>
<th>Application</th>
<th>Radiation Detected and relative detection efficiency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GM (&lt;2.0 mg/cm² window thickness)</strong></td>
<td>Detecting the presence of radiation. Typically used to scan patients for contamination. Can be purchased with or without detachable probe.</td>
<td>Alpha (highly dependent on detector window thickness and distance from source) Beta (energy dependent): $5%<em>{14C}; 32%</em>{32P}$ Gamma: $&lt;1%$</td>
<td>Very rugged and dependable. Energy dependent and not recommended for measuring dose rate unless the meter has been calibrated for the isotope(s) in question. May become saturated at very high count rates and appear not to detect the presence of radiation.</td>
</tr>
<tr>
<td><strong>GM – energy compensated</strong></td>
<td>Used to measure dose rate and/or accumulated dose</td>
<td>+/- 20% of true value (typical) for gamma emitters (60 keV to 1.3 MeV)</td>
<td>Able to provide dose rate or accumulated dose information in widely varying temperature and humidity conditions.</td>
</tr>
<tr>
<td><strong>NaI</strong></td>
<td>Detecting the presence of gamma radiation. Typically used to scan patients for contamination.</td>
<td>Low energy gamma emitters - thin window NaI (typically 1 mm) low energy gamma emitters (approximately 10-60 keV): $19%_{125I}$ High energy gamma emitters – 1&quot; x 1&quot; or 2&quot; X 2&quot; thick: maximum sensitivity around 100-120 keV</td>
<td>High sensitivity; energy dependent; may be less effective in high background conditions. Shock sensitive and should not be dropped on a hard surface.</td>
</tr>
<tr>
<td><strong>Ion chamber (1 to 7 mg/cm² window)</strong></td>
<td>Establishing dose rate estimates for gamma and bremsstrahlung from energetic beta emitters</td>
<td>Energy independent</td>
<td>Readings may be influenced by environmental conditions.</td>
</tr>
<tr>
<td><strong>Electronic dosimeter (contains energy compensated GM tube)</strong></td>
<td>Monitoring accumulated radiation dose for medical staff</td>
<td>Energy independent (see information on ‘GM – energy compensated’)</td>
<td>Can provide instantaneous accumulated dose information.</td>
</tr>
</tbody>
</table>
Appendix 10.3

Section 9

OSHA Operations Level Training Documentation Requirements

Trainees must have documented competency at the Awareness level

- **Verbalize** an understanding of the hospital emergency response plan and their roles in this plan and risks to receiving personnel.
- **Verbalize** when PPE is required.
- **Verbalize** the limitations of PPE.
- **Verbalize** the proper care, maintenance, useful life and proper disposal of PPE, decontamination equipment and related supplies.
- **Verbalize** the nature of the potential respiratory hazard and reasons for a respirator.
- **Verbalize** respirator capabilities, limitations and consequences if the respirator is not used properly.
- **Verbalize** how to handle respirator malfunctions and other emergencies.
- **Verbalize** how to recognize medical indications that may limit or prevent effective use of a respirator.
- **Verbalize** when to change cartridges and or/ batteries on PAPR’s.
- **Verbalize** the proper maintenance and storage procedures for respiratory protection equipment.
- **Verbalize** the general provisions of the healthcare facilities respiratory protection program.
- **Verbalize and demonstrate** appropriate selection of PPE.
- **Verbalize and demonstrate** proper decontamination procedures for ambulatory and non-ambulatory patients.
- **Demonstrate** how to properly don, adjust and remove PPE. Staff must be able to demonstrate competency in wearing all PPE including respirator, protective garments, gloves and boots.
- **Demonstrate** proper setup and use of all decontamination-related equipment and supplies.
Chapter 11: Guidelines for Chemical Spills and Disasters

Written by:

Carissa Paz C. Dioquino, MD, MPH

-Head, UP-PGH National Poison Management and Control Center

11.1 Rationale

Chemicals, natural or synthetic, abound in the environment. The University of the Philippines Manila environment is filled with chemicals, not only those for cleaning and pest extermination but also those for student instruction in teaching laboratories, for analysis in the hospital analytical laboratories, for conducting research in the research laboratories. Many chemicals are also needed for patient services (e.g. anesthetic gases, chemotherapeutic drugs).

Chemical related accidents may happen and if they do happen, priority should be given to helping those who have been injured and to containing the spill to prevent others from getting injured. The impact of chemical spills can be greatly reduced if preventive measures are in place and written procedures for emergency response have been disseminated and accepted.

11.2 Definitions

**Hazardous substances** are substances that may be acutely toxic when absorbed by the body or corrosive on contact or possess a risk for fire or explosion or may have the potential for chronic effects like cancer or may adversely affect the ecosystem

**Chemical spill** - the release of a hazardous chemical into the environment that may adversely affect the health of humans.

**Simple spill** - a spill that does not spread rapidly, does not endanger humans and does not affect the environment

11.3 Chemical Spill Prevention

Accidents may happen in any given situation. Spills may happen when dealing with chemicals but their impact on human life and activities can be mitigated if precautions are taken. Prevention of chemical spills and exposures can be minimized in the storage and handling of these substances. Providing appropriate storage areas, utilizing the correct vessels and assistive
transport devices, such as trolleys, for hazardous chemicals can prevent accidents. Following standard procedures when handling these chemicals like using flow hoods or wearing personnel protective equipment will minimize exposure of the staff to the chemicals.

11.4 Chemical Spill Preparedness

The three important aspects of preparedness include:

1) identifying hazardous chemicals in the various areas in the University
2) having written procedures to follow in case of spills
3) having equipments ready for use in case of spills

An effort must be made to identify critical areas in the University that utilize hazardous substances. For each area, a list of all hazardous substances must be made and material safety data sheets for these substances must be compiled ready for reference. Each critical area must have a written plan of response to a chemical spill in the area. The plan must include who to inform, what responsibilities the staff takes in case of a spill, where to evacuate if needed, where spill kits and other materials to handle the spill can be obtained and what first aid measures can be done in case there are victims. Preparedness also includes preparing the materials that would be needed to contain the spill and to protect personnel who will be tasked to do such. All these are usually placed in a highly visible, easily accessible area. Depending on the chemical inventory, the spill kit often contains a handheld brush, a metal or plastic dustpan, paper towels, material bulk (like cat litter), resealable plastic bags, large sturdy plastic bags that can be used as container liners, a container or receptacle to collect the packed residues in. The spill kit must also contain personal protective equipment like goggles, aprons, gloves and foot coverings. These materials should be inspected at regular intervals. Emergency eye wash and shower facilities should be available in working condition at all times.

11.5. Response to Chemical Related Emergencies or Disasters

When a spill has occurred, no matter how small, the office or lab superior and other staff must be informed. Others may have the knowledge that would be needed to assess the situation. Once a spill is announced, all other staff must stay away from the area. Response to a spill starts with an assessment of the situation. The assessment triggers the appropriate response based on the guidelines for response. A conscious documentation of events should be done for reporting and also for reference in the future.
11.5.1 Assess the Situation

A good assessment of the situation takes into consideration the risks to human health, the potential damage to the surroundings and the effects on the environment. Information on material safety data sheets may give an idea of the risks to human health. Spills of chemicals of low toxicity would have much less impact than spills of chemicals with high toxicity. Evaluating if fire or explosion events are imminent is also an important part of this step. The volume of spilled material must also be estimated. Even a small amount of a highly toxic substance may cause more significant problems compared to a large volume spill of a chemical of low toxicity. When the toxicity of the substance is unknown, it is best to consider the substance as having a high risk to human health. Assessing the situation includes consideration of the broader impact of the spill. An example would be evaluating if released vapors or dusts could contaminate the ventilation system of a building.

11.5.2 Response Guidelines

In case of a spill, quickly put up signs and cordon off the area to prevent access. Identify the substance if possible by checking containers surrounding the spill. Inform the supervisor who can get in touch with the National Poison Management and Control Center. If the substance has been identified, the poison center may provide information about how toxic the chemical is, if evacuation is necessary and if first responders with special protective equipment should be called.

For simple spills, the staff may contain the spill themselves as long as they have the protective equipment and clean up materials to carry out the task. When cleaning up, attention must be given to controlling the spread of dust, vapor or liquid by using barriers or adsorbent materials. Clean up residues should be swept, double bagged, sealed and labelled for proper disposal. After the clean-up, the area is ventilated and surrounding areas are decontaminated with soap and water.

When the spills endanger many human lives, a call out for a chemical related emergency or disaster is made (Code 4) and the Incident Command System (as in Chapter 4) should be mobilized for orderly evacuation of the premises. The Bureau of Fire Protection should be notified immediately so that first responders may be mobilized.

If many individuals are exposed, decontamination is performed in the warm zone which is generally located upwind from the chemical incident site. Decontamination entails physical removal of toxic substances from absorbing
surfaces using in most instances water. Removing contaminated clothing can reduce the chemical burden by as much as 70%.

Medical teams in the cold zones can give preliminary measures for symptomatic individuals. More seriously ill victims are stabilized and transported to the nearest hospital.

11.5.3 Documentation

Documentation of the events transpired in a simple write up is important so that factors that enhanced or impeded the emergency response could be identified and strengthened or corrected.

11.6 Recovery from Chemical Related Emergencies

Once the emergency is under control, the university constituents should wait for the signal to return to the workplace or classrooms or laboratories. The signal is given when it has been ascertained that the amount of chemical remaining in the environment (if any remains) would no longer pose a threat to human health.

References


2. Chemical Spills by UCLA. Date accessed: March 13, 2014 http://map.ais.ucla.edu/go/1002825


Annex 1 – Composition of Health and Safety Committee, 2012 - 2014

UNIVERSITY OF THE PHILIPPINES MANILA

The Health Sciences Center
8/F Philippine General Hospital Complex
Taft Avenue, Manila

Dr. Joselito C. Jamir
Chair and Vice Chancellor for Administration

Dr. Reynaldo E. Ang
Co-chair, and Philippine General Hospital, Deputy Director for Administration

Mr. Fevito A. Obidos Jr.
Secretary
All UP Academic Employees Union – Research Extension and Professional Staff REPS Representative

Prof. Maroh T. Altura
UP Manila Institute of Biosafety Committee

Engr. Noel D. Aquino
Philippine General Hospital, Director's Office

Dr. Regina P. Berba
Chair, Infection Control Unit, Philippine General Hospital

Arch. Allen R. Buenaventura
Director, Campus Planning and Development Management Office

Dr. Carissa Paz C. Dioquino
Chair, National Poison Management and Control Center

Prof. Natividad F. Lacdan
All UP Academic Employees Union - Faculty Representative

Dr. Nelson T. Geraldino
Chair, Department of Laboratories, Philippine General Hospital

Dr. Carlos Primero D. Gundran
Philippine General Hospital – Department of Emergency Medical Services

Dr. Renato G. Josef
Department of Environment and Occupational Health - College of Public Health

P/SInsp. Elias D. Lagasca Jr
Chief, UP Manila Police

Prof. Erwin Leyva
College of Nursing

Cmdr. Rodrigo S. Lojera
Commander Security Agency

Dr. Perla S. Macaraeg
Department of Environment and Occupational Health - College of Public Health

Mr. Arthur M. Peralta
Administrative Officer – Campus Planning and Development Management Office

Mr. Ricardo G. Poblete
Mechanical - Philippine General Hospital

Ms. Regina P. Quiñosa
Philippine General Hospital – PAAS

Mr. Ernesto E. Ragudos
All UP Workers Union Representative

Dr. Tristan C. Ramos
Chair – Committee on Health and Environment

Dr. Joel M. Santiaguel
Department of Medicine, Philippine General Hospital

Dr. Edward C. Tordesillas
Chair, UP Manila Health Service
University of the Philippines Manila
The Health Sciences Center
8/F Philippine General Hospital Complex
Taft Avenue, Manila

Subcommittee for the UP Manila DRRM Manual Development
UP Manila Health and Safety Committee

DR. PERLA SARAUSAD-MACARAEG – Chair
MR. FEVITO A. OBIDOS JR. – Secretary
PROF. MAROH T. ALTURA
ENGR. NOEL D. AQUINO
DR. REGINA P. BERBA
ARCH. ALLEN R. BUENAVENTURA
ENGR. LAURO C. CANCERAN
DR. ERLE CASTILLO
DR. CARISSA PAZ C. DIOQUINO
DR. CARLOS PRIMERO D. GUNDREN
DR. RENATO G. JOSEF
PROF. NATIVIDAD F. LACDAN
P/SInp. ELIAS D. LAGASCA JR., Ret. PNP
DR. IRMA R. MAKALINAO
MR. RICARDO G. POBLETE
DR. TRISTAN C. RAMOS
MS. CARLOTA P. SURAT
Annex 2 - Scenes from the Workshop

Vice Chancellor for Administration, Dr. Joselito Jamir (foreground left), and Dean Nina Gloriani (foreground right) during the Opening Ceremonies

Arch. Allen Buenaventura delivered the lecture entitled “Assessment of UP Manila and PGH Site and Building Conditions”
Dr. Perla S. Macaraeg explained the mechanics of the workshop.

Dr. Carlos Primero Gundran presented the various trainings on disaster preparedness and response at PGH and UP Manila.
Above: Guests, members of the organizing committee and participants during the morning lectures

Below: Members of the Pedro Gil Cluster in action during the workshop
Above: Padre Faura Cluster discussed their group output for presentation during the plenary session

Below: Plenary moderator Prof. Erwin Leyva and Dr. Perla S. Macaraeg explained to the participants that their outputs are important in the formulation of the Consolidated Disaster Action Plan for UP Manila and PGH constituents
Above: Engr. Lauro Canceran lead the participants in the “ice breaker’ prior to the open forum

Below: A representative from the Schools of Health Sciences (SHS) informed the participants that emergency preparedness and response plans are also important for their respective institutions
Above: Ms. Gloria Almariego, Taft Cluster Coordinator, stressed the importance of logistical support from the Administration for the success of disaster action plans.

Below: Engr. Noel Aquino, a member of the UP Manila Health and Safety Committee, explained that well-trained members of the Emergency Preparedness and Response Teams (ERTs) are necessary for effective response to disasters.
Annex 3 - Scenes from the Write-shop

Annex 4. UPM EMERGENCY NUMBERS

UP Manila Police (Fire, Bomb threat, Crimes) : 554 – 8434
                       : 554 – 8400 loc. 2551/ 2552
                       UPM Police
                       : 0918 - 3524042
                       Security Agency
                       : 0922 – 9892173

Philippine General Hospital : 554 – 8400

National Poison Control Center (PGH) : 524 – 1078

Infection Control Unit (PGH) : 554 - 8482
                       : 554 – 8400 loc. 3238

UPM Health Service (8:00 am – 5:00 pm) : 554 – 8400 loc. 2076/2077

Dept. of Emergency & Medical Services (PGH) : 554 - 8400 loc. 2508
Emergency Medical Services (EMS) : 523 – 5350

INTRAMUROS FIRE STATION : 301 – 1101 / 527 - 3627/53
MANILA FIRE DEPARTMENT : 527 – 3627 / 527-3653
ASSN. OF VOLUNTEER FIRE BRIGADES : 522 - 2222
PNP-NCR HOTLINES: 838 – 3354 / 838-3203 / 0915 - 3194129
NDRRMC : 911 – 1406 / 912 - 2665
CIVIL DEFENSE OPERATION CENTER
          (for extreme emergencies caused by disasters/calamities) : 911 - 5061
PAGASA : 433 – 8526
RED CROSS : 143 / 911 - 1876

MERALCO : 16211
PNP : 117 / TXT 2920
MAYNILAD : 1626
MMDA : 136
PLDT : 171
DOTC : 7890

UPM-HSC