Hazard and Vulnerability Analysis

This document is a sample Hazard Vulnerability Analysis tool. It is not a substitute for a comprehensive emergency preparedness program. Individuals or organizations using this tool are solely responsible for any hazard assessment and compliance with applicable laws and regulations.

INSTRUCTIONS:

Evaluate potential for event and response among the following categories using the hazard specific scale. Assume each event incident occurs at the worst possible time (e.g. during peak patient loads).

Please note specific score criteria on each work sheet to ensure accurate recording.

Issues to consider for **probability** include, but are not limited to:

1 Known risk
2 Historical data
3 Manufacturer/vendor statistics
4 Subjective evaluation/best estimate
5 Local Emergency Planning Committee input

Issues to consider for **response** include, but are not limited to:

1 Time to marshal an on-scene response
2 Scope of response capability/staff training
3 On site support resources/supplies
4 Estimated severity & duration of the incident
5 Historical evaluation of response success
6 Local Emergency Planning Committee input

Issues to consider for **human impact** include, but are not limited to:

1 Potential for staff death or injury
2 Potential for patient/visitor death or injury
3 Emotional/psychological impact
4 Local cultural norms

Issues to consider for **property impact** include, but are not limited to:

1 Cost to replace
2 Cost to set up temporary replacement
3 Cost to repair
4 Time to recover

Issues to consider for **business impact** include, but are not limited to:

1 Business interruption
2 Employees unable to report to work
3 Customers unable to reach facility
4 Company in violation of contractual agreements
5 Company in violation of regulatory standards
6 Imposition of fines and penalties or legal costs
7 Interruption of critical supplies
8 Interruption of product distribution
9 Reputation and public image
10 Financial impact/burden

Hazard and Vulnerability Analysis

Issues to consider for **preparedness** include, but are not limited to:

1 Status of current plans
2 Frequency of drills
3 Training status
4 Insurance
5 Availability of alternate sources for critical supplies/services

Issues to consider for **internal resources** include, but are not limited to:

1 Types of supplies on hand/will they meet need?
2 Volume of supplies on hand/will they meet need?
3 Staff availability & training
4 Coordination with MOB's
5 Availability of back-up systems
6 Internal resources ability to withstand disasters/survivability

Issues to consider for **external resources** include, but are not limited to:

1 Types of agreements with community agencies/drills?
2 Coordination with local and state agencies
3 Coordination with proximal health care facilities
4 Coordination with treatment specific facilities
5 City/County EMS services capabilities
6 Community volunteers/training
7 Vendor Pre-incident response plans/contracts
8 Other community resources

Complete all worksheets including Natural, Technological, Human and Hazmat.
The summary section will automatically provide your specific and overall relative threat.

Notes:

a. Plan not yet developed
b. Plan approved
c. Training program developed
d. Support materials not on hand
e. Support materials on hand
f. Staff trained
g. Drill/Exercise conducted
h. Goals Not Met
i. Goals Met
/P = Partial

Note:

Coordinated with City of Santa Clarita, Emergency Preparedness Coordinator - 2/05/2004
Coordinated with LA County Sheriff, Emergency Preparedness Coordinator
Coordinated with LA Fire Department, HazMat Emergency Preparedness Coordinator

HAZARD AND VULNERABILITY ASSESSMENT TOOL
NATURALLY OCCURRING EVENTS

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK	Notes
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE		
	Likelihood this will occur	*Possibility of death or injury*	*Physical losses and damages*	*Interruption of services*	*Preplanning*	*Time, effectiveness, resources*	*Community/ Mutual Aid staff and supplies*	*Relative threat**	
SCORE	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 - 100%*	
Blizzard	0	2	2	3	2	2	3	**0%**	
Drought	1	2	2	2	2	2	2	**22%**	
Dust/Sand Storm	1	1	2	1	3	3	3	**24%**	
Earthquake, >6 Local	3	3	3	3	3	3	2	**94%**	
Epidemic/Natural	2	3	2	3	3	3	2	**59%**	
Flood, Local	2	3	3	3	3	3	2	**63%**	
Hurricane	0	0	0	0	0	0	0	**0%**	
Ice Storm	1	3	2	3	3	3	3	**31%**	
Infectious Disease (SARS, etc.)	1	3	3	3	3	3	2	**31%**	
Landslide	1	1	2	2	3	3	2	**24%**	
Severe Thunderstorm	1	1	1	1	2	2	2	**17%**	
Snow/Ice/Hail Storm	2	2	2	2	3	3	3	**56%**	
Temperature Extremes	1	1	1	1	2	2	2	**17%**	
Tsunami - Tidal Wave	0	0	0	0	0	0	0	**0%**	
Tornado	0	0	0	0	0	0	0	**0%**	
Volcano	0	0	0	0	0	0	0	**0%**	
Wild Fire	2	3	2	3	3	3	2	**59%**	
AVERAGE SCORE	**1.06**	**1.65**	**1.59**	**1.76**	**2.06**	**2.06**	**1.76**	**21%**	

Threat increases with percentage.

**** Events in Bold have occurred previously***

RISK = PROBABILITY * SEVERITY		
0.21	**0.35**	**0.60**

HAZARD AND VULNERABILITY ASSESSMENT TOOL
TECHNOLOGIC EVENTS

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK	Notes
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE		
	Likelihood this will occur	*Possibility of death or injury*	*Physical losses and damages*	*Interruption of services*	*Preplanning*	*Time, effectiveness, resources*	*Community/ Mutual Aid staff and supplies*	*Relative threat**	
SCORE	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 - 100%*	
Community									
Air Plane Crash, Commercial	1	3	2	3	2	2	1	**24%**	
Biological Incident	1	3	2	3	3	3	2	**30%**	
Chemical Incident	2	2	2	3	3	3	3	**59%**	
Dam/Levee Failure	1	3	3	3	3	3	2	**31%**	
Dirty Bomb	1	3	3	3	3	3	2	**31%**	
Electrical Service Failure - Commercial	3	2	1	2	1	1	1	**44%**	
Explosion	1	2	2	2	2	2	1	**20%**	
Fire -Large	1	3	3	3	3	3	2	**31%**	
Natural Gas Loss	1	3	2	3	3	2	2	**28%**	
Phone/Data Service	2	1	1	2	1	1	1	**26%**	
Radiological Incident	2	3	3	3	3	3	2	**63%**	
Sewer System Loss	1	1	2	2	2	2	1	**19%**	
Strike/Transportation	1	1	1	1	1	1	1	**11%**	
Water Contamination	1	3	2	3	2	2	2	**26%**	
Water Loss - City	2	3	3	3	2	2	1	**52%**	
Train Derailment	2	2	2	2	2	2	2	**44%**	
Internal									
Biological/Infection Control	3	3	1	2	1	3	2	**67%**	
Communications Systems Failure	1	1	1	2	2	2	1	**17%**	
Chemical Spill or Release	2	2	2	2	3	3	1	**48%**	
Commerical Power Failure	3	1	1	1	1	1	2	**39%**	
Data System Failure	3	1	1	1	1	1	1	**33%**	
Electrical Distribution Failure - Internal	2	2	2	2	2	2	1	**41%**	
Emergency Alarms - Not Clearly Heard in all areas	3	2	2	2	3	3	1	**72%**	
Evacuation Route Hazards	3	1	1	2	2	3	2	**61%**	
Facility Design/ Construction Hazards	2	1	1	1	2	2	1	**30%**	
Fire Alarm Failure	1	3	3	3	2	2	1	**26%**	
Fire, Internal	1	3	3	3	2	2	1	**26%**	
Fire Watch									
Flood, Internal	2	3	3	3	3	3	1	**59%**	
Fuel Shortage	1	3	3	3	3	3	1	**30%**	
Generator Failure	1	3	3	3	3	3	1	**30%**	
Hazmat Exposure, Internal	2	2	1	3	3	3	1	**48%**	
HVAC Failure	1	2	1	2	2	2	2	**20%**	
Information Systems Failure	3	1	1	2	2	2	1	**50%**	
Medical Gas Failure	2	3	1	3	2	3	3	**56%**	
Medical Vacuum Failure	2	2	1	2	2	3	2	**44%**	
Mold/Mildew Growth	3	2	2	2	2	2	3	**72%**	
Natural Gas Failure	1	1	1	2	2	2	2	**19%**	
Radiological Incident	1	1	1	1	3	3	1	**19%**	
Sewer Failure	1	0	2	2	3	3	1	**20%**	
Sick Building Syndrome	1	2	2	2	2	2	1	**20%**	
Steam Failure	1	1	1	1	2	2	1	**15%**	
Storage of Combustibles	2	1	2	2	2	2	1	**37%**	
Structural Damage	1	1	1	2	2	1	1	**15%**	
Supply Shortage	2	2	1	3	2	2	1	**41%**	
Transportation Failure	1	1	1	1	2	2	1	**15%**	
Water Delivery System Failure	3	3	1	2	2	2	1	**61%**	
AVERAGE SCORE	**1.66**	**1.96**	**1.72**	**2.19**	**2.15**	**2.21**	**1.40**	**36%**	

Threat increases with percentage.

**** Events in Bold have occurred previously***

**** Identify nearby sites & hazards where an off site spill/release could put the hospital within the chemical/radiological plume***

RISK =	PROBABILITY *	SEVERITY
0.36	0.55	0.65

HAZARD AND VULNERABILITY ASSESSMENT TOOL
HUMAN RELATED EVENTS

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK	Notes
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE		
	Likelihood this will occur	*Possibility of death or injury*	*Physical losses and damages*	*Interruption of services*	*Preplanning*	*Time, effectiveness, resources*	*Community/ Mutual Aid staff and supplies*	*Relative threat**	
SCORE	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 - 100%*	
Addolesent Kindnap	1	3	0	3	2	2	1	**20%**	
Assultave Behavior	3	2	0	1	2	2	1	**44%**	
Assultave Behavior w/Weapon	1	3	1	1	3	3	1	**22%**	
Bomb Threat	3	1	1	1	3	2	1	**50%**	
Bomb Explosion, Internal	1	3	3	3	3	3	2	**31%**	
Civil Disturbance	1	1	1	1	2	2	2	**17%**	
Dirty Bomb	1	3	3	3	3	3	3	**33%**	
Employee Abduction	1	3	0	1	3	3	1	**20%**	
Facility Lock Down	2	1	3	3	3	3	2	**56%**	
Forensic Admission	3	1	0	0	2	2	1	**33%**	
Hostage Situation	1	3	1	3	3	3	1	**26%**	
Infant Abduction	1	1	1	3	2	2	2	**20%**	
Labor Action, Internal	1	2	1	3	3	3	2	**26%**	
Labor Action, External	1	0	0	1	1	1	1	**7%**	
Mass Evacuation LA Area	1	3	1	2	3	3	3	**28%**	
Mass Casualty Incident (medical/infectious)	2	2	1	3	3	2	2	**48%**	
Mass Casualty Incident (trauma)	1	2	1	3	3	3	2	**26%**	
Search & Rescue	1	2	2	2	3	3	1	**24%**	
VIP Situation	1	0	0	1	2	2	0	**9%**	
Workplace Violence - Other	1	1	1	3	2	2	1	**19%**	
AVERAGE	**1.40**	**1.85**	**1.05**	**2.05**	**2.55**	**2.45**	**1.50**	**30%**	

Threat increases with percentage.

**** Events in Bold have occurred previously***

RISK = PROBABILITY * SEVERITY		
0.30	**0.47**	**0.64**

HAZARD AND VULNERABILITY ASSESSMENT TOOL
HAZARDOUS MATERIALS EVENTS

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK	Notes
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE		
	Likelihood this will occur	*Possibility of death or injury*	*Physical losses and damages*	*Interruption of services*	*Preplanning*	*Time, effectiveness, resources*	*Community/ Mutual Aid staff and supplies*	*Relative threat**	
SCORE	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = Low 2 = Moderate 3 = High*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 = N/A 1 = High 2 = Moderate 3 = Low or none*	*0 - 100%*	
Chemical Exposure, /Cloud From External Source (Fwy, Rail, Plant, etc)	2	3	2	3	3	3	2	**59%**	
Hazmat Incident Mass Casualty *(From historic events at your MC with >= 5 victims)*	1	3	1	3	3	3	1	**26%**	
Hazmat Incident Small Size *(From historic events at your MC with < 5 victims)*	1	1	1	1	2	3	2	**19%**	
Large Internal Spill or Release	1	2	2	1	3	3	1	**22%**	
Radiologic Exposure, External	1	1	1	1	2	2	2	**17%**	
Radiologic Exposure, Internal	1	0	1	1	2	2	2	**15%**	
Shelter in Place	1	1	2	3	3	3	2	**26%**	
Small-Medium Sized Internal Spill	2	1	2	2	3	3	1	**44%**	
Terrorism, Biological	1	3	1	3	3	3	1	**26%**	
Terrorism, Blast	1	2	0	3	3	3	2	**24%**	
Terrorism, Chemical	1	3	2	3	3	3	2	**30%**	
Terrorism, Radiologic	1	1	1	2	3	3	2	**22%**	
AVERAGE	**1.17**	**1.75**	**1.33**	**2.17**	**2.75**	**2.83**	**1.67**	**27%**	

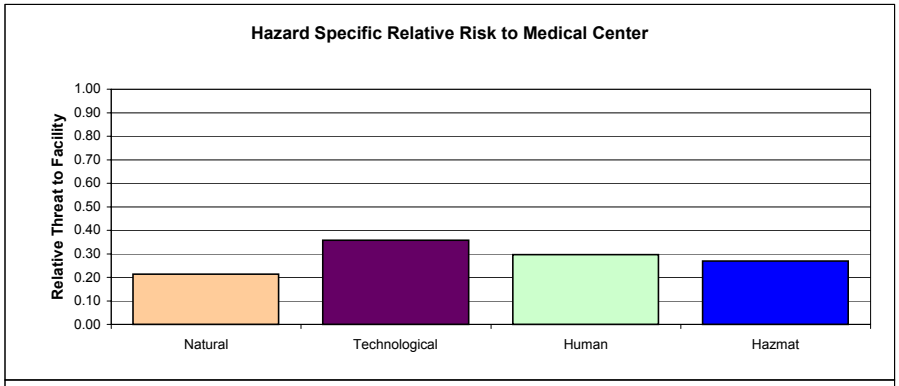
Threat increases with percentage.

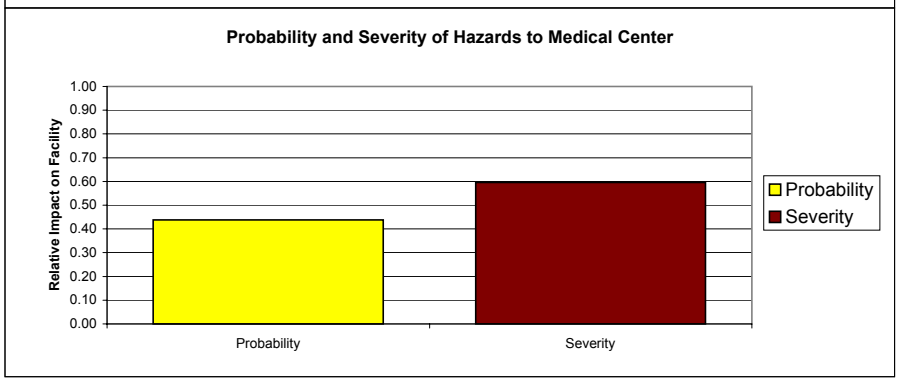
**** Events in Bold have occurred previously***

RISK = PROBABILITY * SEVERITY		
0.27	**0.39**	**0.69**

SUMMARY OF MEDICAL CENTER HAZARDS ANALYSIS

	Natural	Technological	Human	Hazmat	Total for Facility
Probability	**0.35**	**0.55**	**0.47**	**0.39**	**0.44**
Severity	**0.60**	**0.65**	**0.64**	**0.69**	**0.60**
Hazard Specific Relative Risk:	**0.21**	**0.36**	**0.30**	**0.27**	**0.26**





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Key to Notes:
a. Plan not yet developed
b. Plan approved
c. Training program developed
d. Support materials not on hand
e. Support materials on hand
f. Staff trained
g. Drill/Exercise conducted
h. Goals Not Met
i. Goals Met
/P = Partial
x. No hazard specific response will be developed at this time

Based upon a review of the above assessment by the Emergency Preparedness Committee, Safety Committee and Administration the following vulnerabilities have been identified for improvement during this year.

Vulnerability	**Improvement goal measured by:**	**Projected Date:**
1. Disaster Response Plan difficult to use effectively - poor design	Publish a HEICS Disaster Plan	
2. Disaster specific response plans need to be expanded and easier to follow in an emergency	Publish effective disaster specific plans	
3. Staff are not trained to effectively respond to a significant disaster	Conduct a multiagency table top exercise using the new HEICS plan using blast scenarios	
	Conduct quarterly mini disaster drills based on high risk scenarios	Quarterly
	Conduct facility wide disaster exercise based on a high risk scenarios & HEICS	
	Note: Scenarios to be developed using hazards identified in this Hazard Vulnerability Analysis	
	Participate in City/County wide exercise. Scenarios to be developed by local government	

Disaster Preparedness Overview - Assessment Questionnaire

Does the facility have an effective Disaster Manual utilizing ICS/HEICS?
Does the facility have a variety of disaster specific plans in the disaster manual?
Has every department identified potential serious department hazards? (fire, chemicals, workplace violence, equipment/process related, infection control, etc.)
Do departments have supporting department specific plans for each likely hazard?
Does every department have quick access to a cache of appropriate disaster supplies?
Are all staff effectively trained to correctly implement response plans 24/7?
Are Travelers & Temps trained sufficiently to identify hazards and report them correctly? Assigned a buddy to help them to respond correctly?

Incident Commander/Emergency Operations Center preparedness.
Have House Supervisors and Administrators who will likely serve as Incident Commanders been trained to implement and utilize ICS/HEICS effectively?
Is the Emergency Operations Center (and alternate EOC) designed to work effectively with short/no notice incident?
Does the IC and EOC staff have an effective emergency operations manual to help identify critical incident specific responses?
- High level response plans, checklists, report forms, wall charts, key vendor & government 24 hour contact numbers?
- PIO prepared a series of incident specific media releases preformatted to speed fast and effective releases?
- PIO prepared a series of incident specific internal employee releases to speed fast and effective communications?
- Alternate communications systems available (ham radio, pay phones, cell phones, fax, data services, etc.)?

Key utility drawings immediately available to House Supervisor, local Fire Department, contractors 24/7?

Have potential in-house disaster locations been identified?
- Chemical spill/release areas?
- Radiological?
- Hostage?
- Explosion/Blast?
- Confined space?
- Other?
- Areas to handle large patient overflow/surge?
- Staff Shelter Management?
- Alternate EOC location?
- Temporary patient service areas - in case of facility damage

Has the facility identified likely local industries capable of producing large number of causalities been identified?
- Identified by location/industry chemical specific, crush, explosion, release, biological, etc.?
- Have extremely hazardous materials in the community been identified by location?
- Identified hazards in close proximity that could require Facility Lock Down or Shelter in Place?

Are there staff trained to safely and effectively handle hazardous materials incidents?
- Appropriate PPE immediately available?
- Decon facilities easily set up 24/7?
- MSDS & Decon/Patient care protocols available 24/7?
- Staff OSHA HazWoper standard, paragraph (q) trained to protect the facility, themselves and other patients/visitors?
- Staff trained in selection/use of respirators?
- Staff trained to handle acts of terrorism (biological, chemical, radiological, blast injuries)?
- Incident Commanders HazWoper Trained?

House Supervisor, Plant Ops., Security and others trained to implement Facility Lock Down and Shelter in Place 24/7?

Vendors included in disaster response program (critical supplies & services) 24/7?
- Facilities repair, off site data centers, commercial hazmat clean up, medical supply vendors, etc.?

Facility cache of critical response materials established outside the facility?
- Separate building, 40 ft shipping container, etc.?

Hundred and five hundred year flood plain maps from local flood district have been reviewed?

Local flood inundation (dam failure) flood areas in local community identified (Flood Control District & Corps of Engineers)

Facility Disaster Recovery Plan ready to implement?

Staff trained in evacuation procedures?
- When to evacuate vs. when to shelter in place?
- How to move patients safely in an emergency evacuation horizontally and vertically?
- Establish priorities and techniques for patient evacuation?
- Understand Shelter In Place techniques and when to implement?
- Understand Fire/Smoke Compartments and how to utilize them effectively?
- Understand area bomb search techniques and reporting responsibilities for a bomb threat?
- Know how to sign doors/compartments that have been searched?
- Understand limits on implementing Search & Rescue without proper training and life support materials?

Other:

Table Math
Average score of each column is sum of the column divided by the total number of events
Probability divisor is 3 times the number of events (each event can be scored up to a 3)
Severity divisor is the number of events times 3 (highest possible score) times 6 (the number of severity ratings per event)