

The HRVA – Moving through the Process

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What is Hazard and Risk?

- Hazard – Dangerous event or situation that may lead to an emergency or disaster with the potential to have an adverse effect on health, could cause injury or loss to people, property and the environment. A hazard is a “potential”
- Risk – the likelihood of a specific effect within a specific peril (probability, consequences and vulnerability)



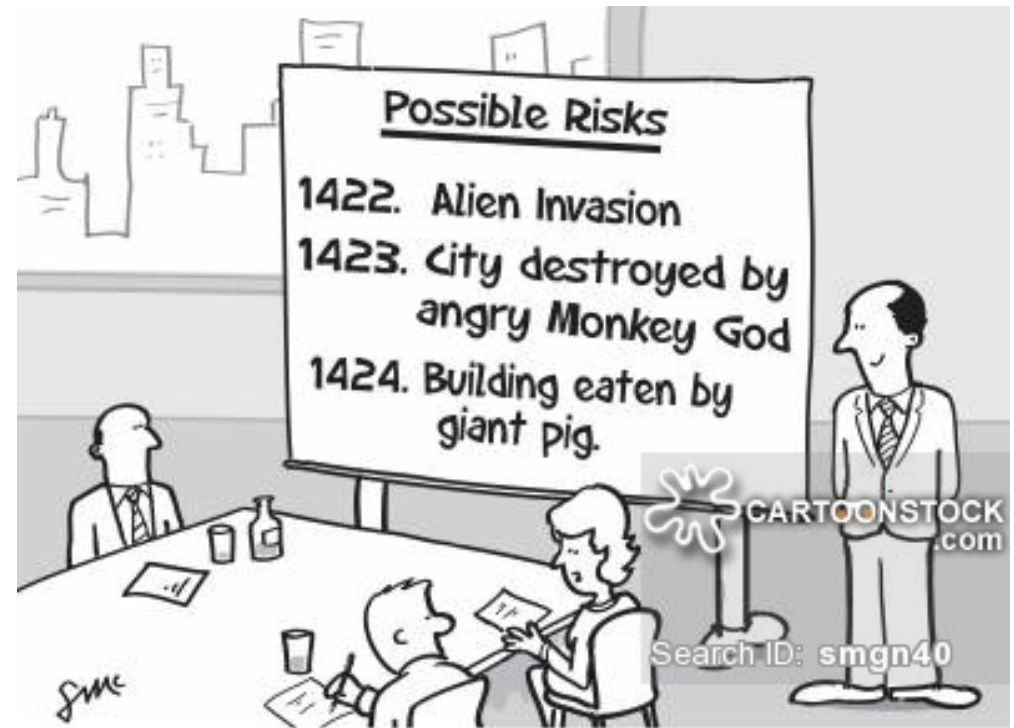
What is an HRVA?

- An HRVA is a systematic approach to identify hazards, evaluate risk and incorporate appropriate measures to manage and mitigate risk for any work process or activity.



Why do an HRVA?

- Identify Hazards
- Evaluate Risk
- Incorporate Measures
- Foundation Document for Corporation



"Well he certainly does a very thorough risk analysis."



Success lies with a team!

- Bring in a set of “Outside” eyes – ERMC hired as consultant to conduct HRVA
- Team of experts
- Continuous process
- Identify measures



Establishing Buy In

- Establish level of involvement
- Explain why they are being included
- Create awareness of how their organization can utilize



Provide Context

- Utilize past statistics and information
 - HRVA
 - Emergency Response and Recovery Plans
 - Economic Development Statistics/Research
 - Private Sector Reports
 - Business Reports

Road Trip

- Strategic points
- Provide “feel for city”
- Outside eyes





1st Meeting

- Establish Purpose
- Establish Process
- Set Expectations
- Establish Timeline



How do you measure?

- Establish matrix
- Set criterion

Probability of Occurrence

Scoring	Qualitative Measures of Likelihood (Probability) of Occurrence
4	Frequent or Almost Certain , <i>exposure to hazard will occur if not attended to and will result in repeated incidents</i>
3	Moderate or Likely to occur , <i>exposure to hazard is common to this region and has happened infrequently in municipalities</i>
2	Unlikely or improbable , <i>exposure to hazard is conceivable but unusual, unlikely in the region but heard of similar incidents</i>
1	Highly Unlikely or rare , <i>exposure to hazard is rare for this region</i>

Probability of Consequence/Impact

Scoring	Consequence/Impact on People, Property, and Environment
4	Catastrophic , <i>Multiple fatalities, municipal evacuation, widespread long term environmental impact, no or minimal stakeholder confidence</i>
3	Severe , <i>Multiple serious injuries or one fatality or adverse long term health impact, severe - medium term environmental impact, release requiring significant clean up, widespread reduction in stakeholder confidence</i>
2	Moderate , <i>Serious injury (First Aid, Illness), minimal property damage, release with minimal short term adverse effects on the environment, moderate reduction in stakeholder confidence</i>
1	Minor , <i>Minor injuries, minimal impact if any on public, equipment or property damage, environmental impacts confined locally, minimal or no reduction in stakeholder confidence</i>

Hazard Identification and Analysis

British Columbia's Hazards

NATURAL HAZARDS	HUMAN / TECHNOLOGICAL HAZARDS
Atmospheric	Transportation Incidents
Snowstorms	Surface vehicle accidents
Blizzards	Aviation related incidents
Ice storms and ice fogs	Ships, boats, barges & ferries
Geo-magnetic storms	Train, subway, light rail crash
Hailstorms	Bridge collapse
Windstorms	Tunnel accident or fire
Hurricanes/cyclones	Energy / Utility Incidents
Thunderstorms	Fuel shortage
Lightning	Power outage
Tornadoes	Water shortage
Dust and Sandstorms	Communication problems
Avalanches	Fires / Explosions
Cold / exposure	Wildland Interface
Heat waves	Industrial
Global weather	Residential
Geological	Health care
Landslide	Arson
Land subsidence/sinkholes	Bomb / explosion
Earthquake	Structural failure / accident
Expansive soils	Dam / levee failures
Hydrologic/Tsunamis	Building collapse
Floods and flash floods	Bridge collapse
Storm surges	Hazardous materials
Droughts	HAZMAT / Oil spills
Erosion	Chemical / WMD
Ice jams	Sour Gas



Discussion and Debate



Homework

- Individual Assessments
- Time Frame

Category – Type	Natural – Seismic	
Specific Scenario	<ul style="list-style-type: none"> ❖ ground motion, surface faulting, ground failure, liquefaction and tsunamis ❖ delays in food gas, and power deliveries ❖ delays in food deliveries, Isolation on the island 	
Lead Time	<ul style="list-style-type: none"> ❖ minimal 	
Probability	<ul style="list-style-type: none"> ❖ lies within most active earthquake zone in Canada ❖ 2001 Seattle (6.8) ❖ considered due / overdue for offshore "megathrust" earthquake as well as the smaller, more frequent 	<p><u>Score:</u></p> <p>4, 3,3,3,4,3,3</p> <p>(3)</p>
Consequence	<p>Injuries/Fatalities:</p> <ul style="list-style-type: none"> • may be severe and numerous with head injuries and collapsed lungs claiming many in the first few days before kidney damage related to crush injuries and untreated chronic disease have a major impact. • post-quake fires without fire-fighting water may be an issue <p>Critical Facilities:</p> <ul style="list-style-type: none"> • schools/hospitals • all would be compromised – minimal upgrades to seismic standards, Downtown built on mine shafts and fill. • response agency facilities, hospitals, older building construction <p>Lifelines (Water, Gas, Power):</p> <ul style="list-style-type: none"> • gas, electricity mainly come from "the mainland" and may cease operation. • liquefaction is likely to cause multiple pipeline ruptures. • all compromised <p>Environmental Impact:</p> <ul style="list-style-type: none"> • chemical, petrochemical, sewage – localised • alteration of streams • catastrophic, • hazmat, flood, decay <p>Economic / Social Impact:</p> <ul style="list-style-type: none"> • significant • catastrophic, isolated on the island therefore help will take longer to get to the area. Inundation from the Region to access City services, people are not prepared, Long term recovery. City infrastructure aging and facilities requiring 	<p><u>Score:</u></p> <p>4, 4,4,4,4,4,4</p> <p>(4)</p>

	<p>upgrades.</p> <ul style="list-style-type: none"> • Could be complete loss of infrastructure, support business, and transportation routes • Hundreds of residents displaced <p>Additional Notes/Considerations/Mitigation Efforts:</p> <ul style="list-style-type: none"> • a regional earthquake is likely to also affect Victoria and Vancouver and thus impede assistance to Nanaimo. • tsunami from and earthquake event occurring elsewhere (i.e. Shelf drop on lower mainland) • monitor pets for weird or unusual actions/reactions • long term recovery – potentially years • emphasis on personal actions as well as impact of non-structural mitigation on survival. 	
Total Score		(7)
<u>Vulnerabilities</u>	<p>People: <i>all, especially those that believe it will never happen here and in some cases blocking mitigative efforts</i></p> <p>Place: <i>downtown (older buildings and in a liquefaction zone), the port (liquefaction), downtown core – old buildings and mine shafts, schools not upgraded</i></p> <p>Preparedness: <i>people do not believe will happen – residents are not prepared, Municipality not prepared, have made great strides but still a lot more required - building codes and bylaws</i></p> <p>Time: <i>no pattern identified</i></p>	



Take Another Look

- Individual assessment sheets distributed
- 2nd meeting of committee held
- Prove your points

The Reference Sheet

Hazard	Probability	Consequence	Total Score
Natural			
Seismic	3	4	7
Severe Weather	3	3	6
Epidemic	2	4	6
Fire – Municipality/Rural (Structural)	4	3	7
Flooding	3	2	5
Landslide / Debris Flows	3	2	5
Drought	3	2	5
Wildfire	3	2	5
Man Made - Technological			
Prolonged Power Outage	3	3	6
Structural Collapse	2	3	5
Dam Failures	2	4	6
Mine Shaft Failure	3	2	5
Tele-Communications Failure	3	3	6
Man Made – Human Interface			
Rail	3	4	7
Marine	4	3	7
MVA	4	3	7
Aircraft	3	3	6
Security - Terrorism	3	3	6
Explosions	3	3	6

Hazard	Probability	Consequence	Total Score
Social Disturbances	3	2	5
Man Made - HAZMAT			
Hazardous Material (Loss of Containment)	3	4	7
Man Made – (Of Local Interest)			
Mental Health	4	2	6

The Matrix

Legend	Low	Medium	High
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(n) – Natural Hazard	(m) – Man Made Hazard
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PROBABILITY	4		(m) – Mental Health Issues	(m) – Marine (m) – MVA (n) – Fire	
	3		(n) – Drought (n) – Flooding (n) – Landslide/Debris Flow (n) – Wildfire (m) – Social Disturbances (m) – Mine Shaft Failures	(m) – Severe Weather (m) – Power Outage (m) – Aircraft (m) – Security – Terrorism (m) – Explosions (m) – Telecommunications Failure	(m) – Rail (n) – Seismic (m) – Hazmat
	2			(m) – Structural Collapse	(m) – Epidemic (m) – Dam Failures
	1				
	-	1	2	3	4
CONSEQUENCE					

Priority for Review



Mental Health

- A causal factor
- Impact to response
- Man made emergencies



Public Safety Risk Management Framework

PUBLIC SAFETY RISK MANAGEMENT FRAMEWORK

RISK	RISK ASSESSMENT	ADVANCE MITIGATION	RESPONSE PREPAREDNESS	RECOVERY PREPAREDNESS	RESPONSE	RECOVERY
MEDICAL EMS	-HRVCA -Response History -Cardiac, Trauma Data	-Pub Ed on Web -BP Screening -Fall&Injury Prev.	-Medical Delivery Plan -FR/EMR/PCP Training -MCI Plan -Std. Resp. Coverage		-Fire assignment -DOC (for MCI) -ECC (for MCI) -EMBC	
Epidemic	-WHO, Provincial Health Officer/ EMBC	-infection Control Plan	-infection Control Plan -Support Vaccination Clinics -Response & Recovery Plan	-infection Control Plan	-Com Asst. Prog -DOC -ECC -EMBC	-infection Control Plan -Info Centre
STRUCTURAL Buildings	-HRVCA -RHAVE: Number L/MH Risk -Response History	-Code Enforce BCBC/BCFC -Building Bylaw -Sprinkler Bylaw -Fire Safety Plans - GetSet Pub Ed	-Target Hazard ID Pre-Incident Plans -Std. Resp. Coverage -OG's -Response & Recovery Plan	-Community Asst. Program Design -ReBuild Program - GetSet Pub Ed	-Fire assignment - Mutual Aid -Com Asst. Prog -DOC -ECC -EMBC	-Investigation Public info -PI Neighbor Meeting -ReBuild Process -
Critical Infrastructure	-HRVCA -Critical Infr. Plan	Consult NPPA & Post Disaster Engineering Standards	-Critical Infr. Plan -Response & Recovery Plan	-Critical Infr. Plan Secondary sites	-Fire assignment -Public Works -Com Asst. Prog -DOC -ECC -EMBC	
WILDLAND / INTERFACE	-HRVCA -Hazard Map -GIS Mapping -Response History	CWPP -FireSmart Fuel Mgmt. -Dev. Plans -GetSet Pub Ed	-Resourcing -Structural Prot. Unit -FireSmart GIS Risk Mapping -Inter-Agency Plans -Std. Resp. Coverage -Resp & Recovery Plan	CWPP -Community Asst. Program Design -ReBuild Program - GetSet Pub Ed	-Fire assignment -MoF -Mutual Aid -Com Asst. Prog -DOC -ECC -EMBC	-Investigation -Public info -PI Neighbor Meeting -ReBuild Process -

Where do you go from here?



Recommendations

- Mitigation, Preparedness Response and Recovery
 - Eg. Mine shaft mapping,
 - Hazmat truck routes
 - Enhanced Public Notification System
 - Business Continuity Planning.
- Foundation Document



RECOMMENDED

Thank You!

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