

APPENDIX 2: DOI RISKS TO MUSEUM COLLECTIONS — A TOOL FOR SELF-ASSESSMENT

1. DEFINING RISK

Terminology

Asset: Life, property, or the environment.

Damage: Loss due to injury, destruction, or disappearance. Some damage is recoverable, some is not.

Exposure: The measure of likelihood or potential extent of loss (i.e. museum in a river valley).

Hazard: A condition which may increase the chance or magnitude of loss (i.e. faulty wiring).

Loss: An unintentional decrease in quality, value, or function of an asset.

Direct Loss versus Indirect Loss:

Direct Loss = Compensation

Indirect Loss = Income, productivity, image

Peril: Cause of Loss (e.g. Earthquake, Explosion, Fire, Flood, Theft, Water Damage, Windstorm)

Risk: (a) uncertainty of loss; (b) frequency x severity.

Threat/Hazard (T) x Vulnerability (V) = Risk (R)

Threat: An undesirable event, the occurrence of which is likely to result in a loss.

Vulnerability: The susceptibility of an asset to loss.

2. IDENTIFYING RISK

In identifying risks to collections, consider the following factors to obtain an overall picture of the situation.

Topography

- Rivers and lakes
- Coastal sites
- Gradient

- Access
- Seismic stability
- Flora and fauna

Physical conditions

- Temperature
- Relative humidity
- Precipitation and storms

Building

- Structure: outside/inside; top to bottom
- Activities: normal; special events
- Essential services
- Safety and security

Museum Collection

- Type of collection: mixed; specialized
- Nature of collection: types of artifacts; materials, amount
- Inherent risks: i.e. firearms; medical equipment
- Sensitivity of certain artifacts or materials

External influences

- Commercial and industrial hazards
- Civil disturbances/terrorism/war

Topography

Rivers and lakes

- _____ Is your building located in a flood plain?
- _____ Is the basement above flood level?
- _____ Is the basement above the local water table?
- _____ Is the river tidal?
- _____ Could a combination of heavy run-off and spring tides cause flooding?
- _____ Does the river/lake freeze in winter?
- _____ Could an ice-jam in the spring result in flooding?
- _____ Is there a dam or barrage upstream?
- _____ Have you discussed your situation with the river conservation authorities

to ensure that they will warn you of any unexpected flooding or manipulation of water levels?

Special concerns: _____

Coastal sites

- _____ Is your museum sufficiently above high-water levels to escape flooding even if a high tide coincides with a hurricane or severe on-shore gale?
- _____ Is your waterfront secure from erosion?
- _____ Is there any part of the museum, including docks and moored vessels, within range of wave-borne debris such as logs?
- _____ Is your location sufficiently above sea level to escape a tsunami ("tidal wave") resulting from seismic activity (not necessarily local)?

Special concerns: _____

Gradient

- _____ Is your building beneath a steep slope?
- _____ Could the building be subject to landslides caused by heavy precipitation, warming at higher elevations, or earth tremors?
- _____ Does rain water and melting snow drain away from the building, or does water pool against the foundations of the building following heavy precipitation?

Special concerns: _____

Access

- _____ Is your building situated in an isolated location?
- _____ Are roads to your building kept clear for emergency services year round?
- _____ Will large vehicles have trouble negotiating narrow roads/tight turns/steep hills?
- _____ Are there any low height clearances (e.g. old railway bridges, overpasses) that could impede access during an emergency?
- _____ Is the route to the building usually impeded by parked vehicles?
- _____ Are there fire hydrants nearby?
- _____ Are the fire hydrants accessible?
- _____ Is the water pressure in the hydrants adequate for firefighting?
- _____ If the museum is located in an isolated area, is there an alternative source of water (lake or river) for firefighting?

Special concerns: _____

Seismic stability

- _____ If your region is at high risk for earth quakes or earth tremors, do you know how to prepare your museum and collections to minimize damage?
- _____ Do you know the risk factor of your region for earthquake intensity and frequency?
- _____ Could an earthquake cause the soil on which your museum is situated to liquefy?
- _____ Is your region volcanic?
- _____ Could the site of your museum be affected by a mud or lava flow or ash fall-out?
- _____ Could a “hot spot” at a higher elevation cause a mud-slide or avalanche?

Special concerns: _____

Flora and fauna

- _____ Is your building secure against the entry of rodents and small animals as well as larger animals (such as a moose or a bear)?
- _____ Could access routes or services to your building be affected by a grass or forest fire?
- _____ Are any trees close enough to fall on a building during high winds or as a result of earth movement?
- _____ Are tree roots close enough to the building to damage the foundation or block drains?
- _____ Do birds roost on the roof or eaves, or in the chimney? (Dead birds and nests can block roof drains or chimney completely, resulting in a water back-up or fire hazard.)

Special concerns: _____

Physical conditions

Temperature

- _____ Is your region subject to extreme or sudden changes of temperatures?
- _____ Do you know how quickly the temperature in your building will reach an unacceptable level if the heating, air conditioning, or ventilation system in your building fails?
- _____ Do you know how to minimize damage to the collections if the temperature in your building changes suddenly, or dramatically?

Special concerns: _____

Relative humidity

- _____ Is your region subject to extremes or sudden changes of relative humidity?
- _____ Do you know how quickly the relative humidity in your building will reach an unacceptable level if the heating, air conditioning, or ventilation system in your building fails?
- _____ Do you know how to minimize damage to the collections if the relative humidity in your building changes suddenly or dramatically?

Special concerns: _____

Precipitation and storms

- _____ Is your region subject to heavy or prolonged rain or snowfall?
- _____ Could a storm or exceptional precipitation affect access of essential personnel, emergency services, or communications?
- _____ If your region is subject to hurricanes/tornadoes/severe electrical storms/ice/high winds, do you know how to prepare your museum to minimize damage?
- _____ If flooding is a possibility, do you know how to prepare your museum and collections to minimize damage?

Special concerns: _____

Building

Structure

- _____ Is your museum a historic building?
- _____ What type of material is it constructed of: wood; brick; stone; concrete; other?
- _____ Are any of these materials flammable?

- _____ Has it been retrofitted?
- _____ Does it have out-of-date or inadequate wiring or plumbing?
- _____ Has all/any of the plumbing or wiring been replaced?
- _____ Is your building earthquake resistant? Are those around it?
- _____ Has your building structure/site been inspected recently?
- _____ Are all the building/site repairs and maintenance up-to-date?
- _____ Has lightning protection been installed? Has it been inspected recently?
- _____ Have chimneys been cleaned and inspected for obstructions recently?
- _____ If your museum has a flat roof, is it watertight? Are roof drains kept clear?
Is heavy snow accumulation removed?
- _____ Are skylights or roof access doors waterproof under conditions of high
winds, heavy rain, or melting snow?
- _____ If the roof drains are external, are they subject to freezing?
- _____ If the roof drains are internal, can you trace them through the building?
Are they accessible? Are their locations marked on a diagram of the
building?
- _____ Are gutters and roof drains kept clear of leaves, nests, dead birds, or other
obstructions?
- _____ Are downspouts long enough and placed so water is directed away from
the building?
- _____ Is the site secure against leaks? Are collections stored there?
- _____ Does the museum have an effective damp course (a barrier against rising
moisture from the ground)?
- _____ Is the basement checked after each rainfall and during thaws for signs of
dampness, water, or cracks?
- _____ Is your museum well insulated?
- _____ Does the museum have an effective vapor barrier? (Bally only)

- _____ Are basement drains adequate/unobstructed/in good working order?
- _____ Does the museum have water detectors in the basement or other areas prone to flooding?
- _____ Are collections stored in the basement? If so, are they raised at least 4-6" off the floor?
- _____ Are workshop, laboratory, and kitchen drains equipped with the appropriate grease or acid traps? Are they cleaned regularly?
- _____ Are sinks and toilets checked at the end of each day to make sure that they are not clogged or overflowing?
- _____ Are there overhead pipes in collection areas? If so, are pipes inspected regularly?
- _____ Are the building's heating, ventilation, and air-conditioning systems inspected and maintained regularly?
- _____ If fireplaces or wood-burning stoves are used, are they in good working order? Cleaned and inspected regularly? Surrounded by fire-resistant materials? Chimneys kept unblocked? Fire screens used in fireplaces? Fire extinguishers kept handy?

Special concerns: _____

Activities

- _____ Are gasoline-powered tools (e.g. chain saws, pumps, generators, lawnmowers, snowblowers, outboard motors, etc.), or fuel for them, stored in the building?
- _____ Is flammable gas-powered equipment (e.g. gas stoves, welding equipment) stored or used in the building?
- _____ Are cylinders of flammable or explosive gases used or stored in the building?
- _____ Are work areas kept clean and hazard free (e.g. sawdust vacuumed up, trash removed, and oily rags disposed of)?

_____ Are all potentially hazardous chemicals and substances stored, used, and disposed of in accordance with the appropriate safety standards?

_____ Are extra safety precautions taken during construction and renovations?
****Many museum disasters, especially fires, have occurred during construction and renovation projects****

_____ Are potentially hazardous activities (such as the use of interpretive fires – wood-stoves, fireplaces, oil lamps, forges, firearms) undertaken at your museum?

_____ Is all or part of the museum used by other groups or organizations during (a) office hours, (b) during the evenings or weekends? If another organization uses part of your building, do you have practical control over their activities?

Special concerns: _____

Essential services

_____ Are the telephone numbers for all essential services prominently displayed besides more than one telephone? Are those numbers checked and updated annually?

_____ Do you have a way of contacting emergency and essential services if the telephones in your area are not functioning?

_____ Do gas, water, and electrical services in your building comply with the appropriate building and safety codes?

_____ Is the museum's electrical system adequate? In good condition?

_____ Are electrical/gas/plumbing/sprinkler systems inspected and maintained?

_____ Do you and your staff know where the master switches and turn-off valves for the electrical, gas, sprinkler, and plumbing systems are? Do you know how to operate them?

_____ Are current diagrams of electrical/gas/plumbing/sprinkler systems, including their master switches and turn-off valves, readily available in an emergency?

- _____ Are services to different parts of the building clearly marked?
- _____ If your museum is part of a larger complex, do you know which parts of these services are your institution's responsibility?
- _____ If a service fails, is there a back-up or alternative service?
- _____ Are any of these services dependent on another (e.g. electrically fired oil furnace or electrically-powered water or drainage pumps)?
- _____ Do any of them share common transmission routes (e.g. electricity and telephones sharing common conduits or power poles)?
- _____ Have you discussed your institution's special needs with the suppliers of essential services to ensure that services will be resumed as soon as possible in the event of an outage?

Special concerns: _____

Safety and security

- _____ Is the museum equipped with state-of-the-art smoke detectors? Heat detectors? Fire alarms? Portable fire extinguishers? Automatic sprinkler system? Are they inspected and maintained according to the manufacturer's specifications?
- _____ Are portable fire extinguishers replaced or refilled immediately after use? Is staff trained in their use?
- _____ Are the numbers for Fire, Police, and Ambulance prominently displayed by all telephones?
- _____ Do you have a plan for calling the fire department and evacuating the building if there is a fire? Have you practiced it recently?
- _____ Has the Fire Chief toured your museum recently to advise on fire safety?
- _____ Have all shifts of the local fire department toured your museum recently to become familiar with the museum, its collections, and its activities? Are the fire fighters aware of the presence and location of any hazardous materials and collections?

- _____ Are staff trained in the use of potentially hazardous equipment and materials?
- _____ Are staff trained in the correct use of fire extinguishing equipment?
- _____ Has your museum ever been subject to theft/vandalism/fire/flood?
- _____ Has the Crime Prevention Officer of the local police department visited your museum to advise on ways of making the museum more secure?
- _____ Have you discussed your institution's special needs with fire and police departments, and with your insurance broker?
- _____ Have you given a copy of your emergency plan to fire and police departments and also to your insurance/legal representatives to ensure that the plan is safe, effective, and legal.
- _____ Do you have 24-hour security at your museum? If not, do you have other means of detecting intrusions?
- _____ Is your building located in an isolated area where thieves and burglars can operate undetected?
- _____ Is the exterior of your building well-lighted at night?
- _____ Are keys controlled? Are keys of the type that cannot be duplicated?
- _____ Are staff, contractors, and visitors adequately supervised?
- _____ If you depend on contract employees or another organization for essential services, such as security and maintenance, are they reliable individually? Collectively? Do you have practical control over their activities?
- _____ Are you aware of local contingency plans for widespread disasters, acts of war, terrorism, or civil disturbances in your vicinity? Do you know how they affect your museum?
- _____ Are emergency exits well marked? Equipped with emergency lighting? Unobstructed, inside and out?

Special concerns: _____

Internal Personnel Threats

- _____ Has the unit experienced missing or damaged objects that may have happened as a result of employee incompetence or inadequate training?
- _____ Has the unit experienced missing or vandalized objects due to suspected disgruntled employees?
- _____ The unit has been free of significant employee relations problems within the past five years.
- _____ Is there a key retrieval system in place when employees retire or leave the unit's employment?

Museum Collection

Type and nature of the collection

- _____ Is the collection mixed or specialized?
- _____ What is the nature of the collection? What sort of artifacts and materials does it contain? Furniture/Ceramics/Textiles/Books/Archival materials

Inherent risks

- _____ If you have an industrial collection, has the entire fuel system of all internal combustion engines, including their lines, pumps, and carburetors, been completely drained?
- _____ Have explosives (blasting caps, fuses, flares, charges, live ammunition, fireworks, military pyrotechnics, etc.) or other incendiary or flammable materials or objects in your collection been checked by the proper authorities and deactivated or disposed of accordingly? Has this information been recorded?
- _____ Does your collection include biological specimens preserved in alcohol or formaldehyde?
- _____ Does your collection contain any material which may contain PCBs (e.g. old transformers)?
- _____ Does your collection contain biological specimens that have been treated with arsenic or other toxic chemicals?
- _____ Does your collection contain geological specimens that may emit radon?

- _____ Have these and other dangerous items in your collections, such as doctor's and veterinarian's kits, poison darts, etc. been labeled to warn other staff of their danger?
- _____ Have all hazardous items been removed from exhibits and placed in locked cases or otherwise made inaccessible?
- _____ Do you have any cellulose nitrate film in your collections? If so, has it been copied onto another material by an experienced firm, and has the original been disposed of according to instructions from the fire department or placed in cold storage?
- _____ Is your local fire department fully aware of the existence and location of all hazardous materials and collections?

Special concerns: _____

Sensitivity

- _____ Which objects in your collection would you consider to be the most vulnerable to damage by fire/water-moisture/toppling?
Textiles/Documents/ Photographs/ Paintings
- _____ Do you know which objects are most sensitive to extremes or fluctuations in relative humidity?
- _____ Do you know which objects are most sensitive to extremes or fluctuations in temperature?
- _____ Have you created lists of the most vulnerable objects for possible removal in case of emergency or for priority salvage.

Special concerns: _____

External influences

Commercial and industrial hazards

- _____ Would a fire, explosion, or structural collapse in an adjacent building affect the museum, access routes, or services to it?
- _____ Are any hazardous activities located nearby?
- _____ Are any hazardous materials (fuels, chemicals, waste) manufactured, stored, used, or transported nearby?
- _____ Is the building subject to vibration from traffic (road, rail, or air) or construction blasting nearby?
- _____ Is your museum located near a nuclear power plant?
- _____ Is your museum located below the flight path of an airport?

Special concerns: _____

Civil disturbance/Terrorism/War

- _____ Is the museum situated in an area where political or social tensions may place the museum at risk (e.g. damages incurred during a riot resulting from the closure of a major employer)?
- _____ Could your institution or its collections be the target of a protest group?
- _____ Is your museum/site in an area prone to violent demonstrations?
- _____ Has your museum/site been, or likely to be, the subject of an act of terrorism?
- _____ Is your museum/site a military museum or does it have military connections?

Special concerns: _____

