



International Committee  
on Museum Security



INTERNATIONAL COUNCIL OF MUSEUMS  
CONSEIL INTERNATIONAL DES MUSEES  
CONSEJO INTERNACIONAL DE MUSEOS

# HANDBOOK ON EMERGENCY PROCEDURES



**Developed by members of the ICMS**

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**Editor:** Willem Hekman (The Netherlands)  
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<http://icom.museum>

ICOM in short

Created in 1946, ICOM (International Council of Museums) is an international non-governmental organization maintaining formal relations with UNESCO and having a consultative status with the United Nations' Economic and Social Council. ICOM is the only international organisation representing museums and museum professionals.

ICOM is:

- A diplomatic forum made up of representatives from 137 countries and territories
- Standards of excellence for museums including ethics (Code of ethics for museums)
- An international network composed of 30,000 museum professionals around the world
- A think-tank composed by 31 International Committees which represent ICOM's specialities
- Missions of international public service notably in the fight against illicit traffic and emergency programmes in case of natural disasters or armed conflicts

# Introduction

Willem Hekman (The Netherlands)

## **ICMS in short**

Created in 1974, ICMS (International Committee on Museum Security) is an international committee under ICOM representing museum security professionals.

## **ICMS has the following aims:**

- To support the aims and objectives of ICOM, in particular with the reference to museum security
- To formulate and carry out a program of activities related to museum security
- To provide a forum for communication, co-operation and information exchange between museums, professional museum workers and others concerned with museum security
- To provide advice to ICOM on museum security and be a source of professional expertise to assist in the implementation of ICOM's program
- To represent the interests of museum security within ICOM
- To co-operate with the National Committees and Affiliated Organisations in matters related to the Committee's specific mandate and to the broader interests of ICOM

## **Change**

The world is changing, and with it our way of thinking, whether we like it or not. 'Catastrophic terrorism' is just one of the issues, along with increased crime rates and environmental problems, that make us feel unsafe and aware of the potential dangers which surround us.

The way we used to protect our cultural heritage, with a primary focus on protection, is no longer sufficient. There are more risks that endanger our heritage than ever before. We are forced to increase security measurements in a much more sophisticated way than we would like.

Therefore, it is necessary for professionals in the field of art and art security to communicate with each other and to learn from the issues at hand. Make sure your security organisation is an intrinsic and integrated part of the total organisation of your museum. It is not a security issue alone. It is a key issue for the entire museum: it involves staff, visitors, collections, the registration of the collection items, financial data, etc.

## **Handbook**

Within the ICMS specialists in several fields have written chapters about a specific subject starting with an introduction with one or more examples, followed by threats and checklists to prevent an emergency and to deal with an emergency.

This handbook contains in the first edition 10 chapters, but it is a living document and every reader and/or user is most welcome to send additions, comments or amendments to the ICMS. Although the writers and editor have tried to make a professional handbook, they nor the ICMS can be held responsible for any mistakes.

This handbook is published on the ICMS website to be used by everyone concerned with the security and safety of museums; it can be useful for big museums but especially for small museums.

Although nobody wants an emergency in his museum, disasters do happen: so be prepared.

# Risk analysis

Hans-Juergen Harras (Germany)  
Dick Drent (The Netherlands)  
Willem Hekman (The Netherlands)

## Introduction

The world is changing, and with it our way of thinking, whether we like or not. ‘Catastrophic terrorism’ is just one of the issues, along with increased crime rates and environmental problems, that make us feel unsafe and aware of the potential dangers which surround us. These issues affect our way of living and our way of thinking. In this context, we may also reflect on world-wide changes in the field of museum security that have taken place during the last decade.

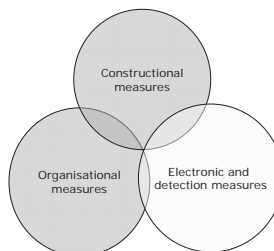
The way we used to protect our cultural heritage, with a primary focus on protection, is no longer sufficient. There are more risks that endanger our heritage than ever before. We are forced to increase security measurements in a much more sophisticated way than we would like – and here the friction lies. It is one thing to discuss the necessary measures taken on Organisational, Constructional and Electronic security levels (also known as the OCE levels) with colleagues from the security field, but it is quite another thing explaining what is required, in this era of new dangers, to a Board of Trustees, to the museum’s director, its curators and conservators, the heads of exhibitions, or other substantive decision-makers in the field of cultural heritage.

Therefore, it is necessary for professionals in the field of art and art security to communicate with each other and to learn from the issues at hand. It is not about right or wrong, good or bad, nice or ugly. It is all about cooperation within a museum and between museums, and to make the most beautiful exhibitions in the most secure way possible.

A few years ago one of the former chairpersons of ICMS, Mr. Bryan Dovey, said:  
‘It is fortunate that disasters do not occur every day in museums and galleries. The very rarity of them can lead to a situation where we hope for the best and are reluctant to prepare for the worst! Forethought and planning can prevent an emergency becoming a disaster and minimise the injury and damage to people and collections.’

Safety and security are reached with the correct measures in the field of guarding (to watch over an object or person) and protecting (to diminish the danger, violence, threat or damage); these measures are mutually connected and strengthen each other.

## Security concept



The measures are divided in Organisational, Constructional and Electronic levels. The organisation will always be the strongest, but also the weakest link in this chain.

### **Analysis of all the risks**

All measures must be based on a thorough analysis of all risks for the cultural institution.

This analysis must cover not only the 'normal' risks like theft, vandalism and fire, but also the risks caused by the 'outside world' of the museum, i.e. floods, chemical spills, war and terrorism.

The following steps have to be made:

- risks inventory and assessment
- identification of the protection goals
- constructional and electronic measures to reduce the risks
- organisational measures to reduce risks or mitigate damage in case of a disaster
- preparing and implementing emergency plans
- training museum staff and security personnel

### **Overall guidelines**

There is no standard format to follow for improving your security organisation, as the needs of each institution are distinct. But there is a logical guide to getting started.

In order to achieve a regular, a customised, or even tailor-made form of security that will be an ideal addition to your organisation, the following is recommended:

- Audit your museum as objectively and thoroughly as possible, so that you can see all the risks and loopholes.
- Risks need to be presented to the decision makers (the Board or director); make them aware that it is their problem to solve – you are there to help, if they will let you.
- Make clear what the loss in value would be when disaster strikes.
- Write out potential scenarios as to where and how these risks can occur in your museum.
- Prepare how to deal with the Press in case of an emergency.
- Create measures at the Organisational, Constructional or Electronic levels that will function specifically to prevent or control these risks.
- Present the necessary budget for your recommended measures to the Board. Make sure that you have decided whether your security measurements should be Regular (along standard lines), Customised (with some elements altered for the specific museum situation) or Tailor-made (for unusual situations and museums that require a re-invention of the Regular measures).
- Keep a register of incidents and near-incidents.
- Repeat the evaluation of risk every year. New circumstances, situations, evaluations, and the real-life testing of existing measures can change your view on security. Do not rest on your laurels, but test and re-test, anticipating problems and ways to beat your own security.

- Make sure your emergency plan is up-to-date: check telephone numbers of emergency services, staff, external conservators, etc.
- Start cooperating with colleague museums on security issues; learn from each other.
- Train not only the guards, but also the responsible people in your organisation. Security management training for exhibition managers will give you a profit you would never believe.
- Work on an audit system with colleague museums, and let your museum be audited by a colleague. No one will be better at finding loopholes in your security than a security director at a nearby museum. You can help each other to improve your respective museums, and make each other's jobs easier. This a safe and inexpensive way to test your security measures.
- Do not be too shy or too proud to get help and advice from colleagues.
- If you work in a large museum: establish a Research & Development section within your museum, specifically for security and facility management.
- Make sure the position of the Security Manager is well placed within in your organisation, preferably directly under the director or business-director.
- Involve in your preventive measures the protection of the collections and of the registration of all the objects, and organise the aftercare for the objects after an emergency.

### **In summation**

- Make sure your security organisation is an intrinsic and integrated part of the total organisation of your museum. It is not a security issue alone. It is a key issue for the entire museum: it involves staff, visitors, collections, the registration of the collection items, financial data, etc.
- There must be a balance between the Organisational, Constructional and Electronic measures.
- There is never a state of perfection, you can always improve.
- Improve your organisation: plan, do, act, check.
- Organise training and drills.
- Be prepared!

# Vandalism

Hanna Pennock (The Netherlands)

## Introduction

In the Fifties the famous Dutch poet Lucebert (1924-1994) wrote a poem of which one line is frequently quoted: 'Everything valuable is without defence'. If we look at the long history of art, we find many examples that support this statement. The motives are often political or religious.<sup>1</sup>

Also recently many acts of vandalism shocked the art world. Only a few years ago a 69 year old man sprayed a chemical substance on *The Celebration of the Peace of Münster* by Bartholomeus van der Helst, one of the top paintings of the Rijksmuseum in Amsterdam.<sup>2</sup>



Luckily only the varnish was damaged, thanks to immediate action of one of the guards. Previously this man had attacked some 165 works of art in Germany; he was in psychiatric care for many years, but in the end he was sent away as untreatable.

Especially modern art is liable to become a victim of vandalism, because the price is high and 'a 4 year old child could have painted it'. In 1986 a Dutchman attacked with a Stanley knife Barnett Newman's colour field painting *Who's afraid of Red, Yellow and Blue III* in the Stedelijk Museum in Amsterdam. Four years earlier, another version of this painting, *Who's afraid of Red, Yellow and Blue IV* in the National Galerie in Berlin, was hit by a student. The weapon he used was part of the barrier that was placed to keep distance from the painting. When the Amsterdam painting was restored, the Dutchman came back in 1997 to damage it again – since it was not exposed at that moment, he took another painting from Barnett Newman, *Cathedra*, and cut it, again with a Stanley knife. He was angry because the restorer had damaged his 'work of art', he declared afterwards.

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<sup>1</sup> See for example M. Egaña (ed.), *Du vandalisme. Art et destruction*, Bruxelles 2005, and D. Gamboni, *The Destruction of Art. Iconoclasm and Vandalism since the French Revolution*, New Haven / London 1997.

<sup>2</sup> Credit: Rijksmuseum Amsterdam (The Netherlands)



These are most painful examples of vandalism. But then there are all these curious visitors who cannot limit themselves to looking only: 'Let me touch it', 'Let me knock on it', 'Let me kick against it'. We cannot refrain from touching objects – apparently we need a tactile contact to support the visual perception, as a means of verification.

A quite different category is pure 'fun' – from my own observation I can mention two sticky examples: chewing gum under the rack in the Prisoner's Gate in The Hague and on a medieval altar piece in the Museum of Religious Art in Utrecht.

### **Definition**

Vandalism is a deliberate act to damage an art object.

### **General**

It is true: art is without defence. But there are many ways to come to its rescue and protect it. The starting point is to make a risk analysis.

The questions a museum should ask, concern 4 categories of vandalism of which the first is the most serious:

1. vandalism based on political, ethnic or religious motives
2. vandalism based on anger or confusion
3. vandalism based on 'fun'
4. vandalism caused by ignorance

Keep in mind that the organisational part of prevention and action is of utmost importance. Make sure that the roles, tasks and responsibilities are well defined, and train at least twice a year. This does not necessarily have to be a real training: discussing an imagined attack in a round table meeting with the staff involved, is very useful as well.

### **Possible threats**

- religious and political issues in connection with your collection
- modern art can be a provocation
- an ex-employee who might take revenge
- arson
- neglect, insufficient maintenance of the collection and building can invite acts of vandalism
- groups of visitors, especially young ones
- public touching the objects
- a rigid design(er) of the exhibition
- an ill placed object

### **Checklist (preventive)**

- be aware which objects might provoke an act of vandalism
- be alert on religious and political issues
- in buying a ticket the visitor agrees with the museum's conditions; make your conditions clear
- observe individual visitors and groups to be aware of their behaviour
- educate your public: explain why they should not touch objects
- bags, walking poles, bottles with liquid, etcetera should be left in the cloak-room
- create physical or visual distance or a barrier between object and public (a rope, glass...)

- secure small objects
- put fragile, rare and small objects in a show-case, if necessary with safety glass
- check the condition of the objects daily
- keep the surroundings of the building and of the objects clean to avoid graffiti
- keep the surroundings of the building clear to avoid arson
- give teachers an instruction and make them responsible too
- accompany groups when necessary with two persons, one in the rear
- light the area at night
- train your guards in recognising suspicious behaviour
- train your guards in responding appropriately to an act of vandalism (towards the perpetrator and to save the object)
- if possible, install CCTV and be sure of the follow-up
- if possible, install an alarm system on the objects or show-cases and be sure of the follow-up
- make a list of responsible staff members such as head of collection, curators, conservators, with their phone numbers, and know where to find it
- make a list of phone numbers of external conservators and know where to find it
- keep an incident register and analyse the incidents
- when an object in the exposition might provoke an act of vandalism, have a stationary guard near the object during the opening hours

#### **Instructions (during the event)**

- protect the object from further damage or danger if necessary
- warn the head of security, according to the procedures
- warn the head of collections or the conservator, who has to decide what to do with the object
- if a substance is sprayed on the object, keep if possible the container to know what the substance is
- keep visitors at a distance
- if possible clear the room
- stay with the damaged object
- when a chemical substance is used: take precautions for your own safety because the product may be toxic
- don't touch the object if that could cause further damage
- don't wipe out any traces that can be of use for the police
- if the offender is still in the museum, avoid escalation; stay calm
- avoid any risk – people and the objects are more important than arresting the offender
- if you can arrest the offender, let two persons stay with him
- call the police and give notice of the attack
- make pictures of the damaged object and the situation
- make a detailed description of the incident for your files and use it in the next risk analysis
- if the press is involved, only the director or the head of the communication department should be spokesman, according to the procedures

# Theft

Pavel Jirásek (Czech Republic)



Photo: National Institute for Heritage Conservation



Photo: National Institute for Heritage Conservation

Church in Velvary – in the 70's and 2000

## Introduction

On December 24, 2005, at 11:00 hours, the operator in the central control room registered a defect in the wire of the glass break detector on the second floor of the Klementinum, the main building of the National Library of the Czech Republic. In this historical building are kept the most significant books and documents for the history of Czech lands, like medieval manuscripts, codices, bibles, and chronicles.

In the building are also the offices of the director and top management of the library. The electronic alarm system of the library is rather complicated, because of the 17th century character of the building. The building is located in the center of Prague nearby Charles Bridge and the old town square. It is a complex of several facilities: the library itself, in the so called Mirror Chapel, two churches and an observatory. They are all national listed monuments in the heart of the Old Town.

Back to the case – usually any technical problems, which are not crucial and appear on Christmas days will be solved after the holy days. Fortunately this was not the case. The service staff was clever enough to call the emergency technical service of the specialized company responsible for the electronic alarm system of the library. A technician came immediately and found that the wire going from the connection box to the detector was cut. Because Christmas Eve was not the best time for a general change of the wire (it was partly installed under the preserved parquet), the technician decided to repair it temporarily. So he connected the glass break detector using an separate wire and made the alarm system complete.

At 2:00 hours a.m. on December 25 the mentioned detector reported a broken window. The city of Prague was sleeping but not the security personnel in the library. The alarm system sent the signal to the central control room and switched on the CCTV. The library is connected to the State police monitoring the center of Prague. Unfortunately the Police came too late to catch the intruders but they left all the equipment like pneumatic hammers etc. in the library and left like bad movie gangsters over the roofs. This intrusion is still under

investigation. The connection between the criminals and a member of the library staff seems to be more than clear.

This example shows us the aspects of the present situation in the protection of cultural goods and also the advantages and weak points of such systems. Thefts are still the biggest threat for cultural heritage institutions and their collections. And it reminds us the old saying: Security is everybody's business.

### **Definition**

Theft is the act of taking something from someone unlawfully.

### **Threats**

Internal:

- location (especially churches)
- lower number and activity of church oriented communities (churches)
- decreasing number of priests (churches)
- bad state of museum/institution building
- inadequate security of objects on display
- visible location of depositories
- low possibility of perimeter control (trees, other buildings)
- non existence of electronic alarm system
- non existence of access control system
- non existence of CCTV
- low quality of guards
- low quality of security system of an institution in general
- low salaries in museum
- low quality of documentation on the collections
- low quality of organizational measures dealing with collection protection
- lower level of internal communication
- lower level of external communication with intervention forces
- longer intervention time than needed

External:

- monetary value of cultural goods, especially works of art
- existing illegal art market
- open borders
- speed of transport means
- different legislative measures in different countries
- non acceptance of international treaties in both developing and developed countries
- religious aspects
- political and social situation

### **Simple rules**

Process of improving the resistance of the museum against theft

- risk identification: analysis of the security situation of the museum
- risk assessment: analysis of the probability and consequences of the threats
- risk evaluation: determination of risk level and its acceptability
- risk reduction: protection plan and implementation of this plan

### Protection plan

- organizational measures:
  - interdisciplinary task
  - definition of the role of each museum employee
- burglary alarm system documentation:
  - interdisciplinary task
  - cost-benefit analysis
  - maintenance budget

### Implementation of the protection plan

- interdisciplinary task
- needs of cooperation with suppliers:
  - mission of the museum: protection and presentation of cultural heritage
  - mission of production companies: profit

### Tools of the implementation of the protection plan

- system of organization of guards
- organizational measures concerning the behavior of the staff and visitors
- intruder detection system
- access control system
- closed circuit television
- internal communication and reporting of emergencies
- internal and external lighting
- transmission of alarm data from the monitoring center to the relevant intervention forces
- textual and visual documentation of cultural objects, their registration and entry in the inventory

### **Checklist**

#### Long term business

- provide risk analysis continually
- inspect the state of the buildings
- keep the emergency plan up-to-date
- maintain cooperation arrangement with the police at the relevant level (local, municipal, county, state)
- maintain an insurance agreement (if available – according to the policy of the institution)
- create specific emergency instructions for all the staff, but differently according to the function of an employee
- provide a continual SWOT analysis<sup>3</sup> of your institution for emergency preparedness

#### Everyday or periodical business

- observe suspected visitors (taking pictures of windows, doors, alarm system components, ...)
- inspect all the alarm and transmission systems daily and deeply in recommended periods
- check all the transport means going inside and outside the institution
- check the goods carried by the guards before and on duty

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<sup>3</sup> SWOT is a method to analyse the Strengths, Weaknesses, Opportunities and Threats of an organization.

- before employing personnel conduct a background investigation including a criminal history check
- check the behaviour of and accompany contractors
- train all the staff for emergency situations – theft
- secure all the objects on display, using individual or collective means for the object's security
- use properly equipped showcases
- check the perimeter of the building
- provide an access control system for the employees to depots, special important areas and showcases etc.

#### After the theft

- close the affected area
- monitor and record all visitors and staff by using CCTV (if available)
- report the theft to the local police immediately
- safeguard all theft documentation (video record, central unit data memory)
- report the theft to the director of the institution
- provide the police with all relevant documentation, incl. photographs of stolen objects and written information according to national and international standard, for example Object ID, go to <http://icom.museum/objectid/checklist.html>
- provide customs with relevant documentation
- check the police for the declaration of a national or international investigation
- notify the insurance broker (if the object was a subject of insurance)
- cooperate with private companies like Art Loss Register or others
- provide relevant associated institutions with relevant documentation (local museum association, ICOM, ...)
- cooperate with antique dealers if possible
- report progress and actions to the director of your institution regularly

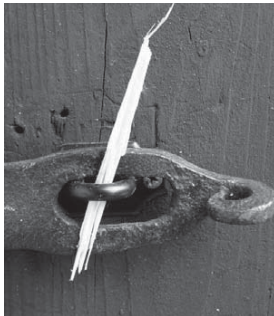


Photo: Pavel Korda

#### Note

Check also many other practical advices written in:

*Collection Theft Response Procedures* (Huntington Library and The Getty Conservation Institute, [https://www.getty.edu/conservation/publications/pdf\\_publications/theftresponse.pdf](https://www.getty.edu/conservation/publications/pdf_publications/theftresponse.pdf))  
*Running a Museum* (ICOM 2004, ISBN 92-9012-157-2, <http://unesdoc.unesco.org/images/0014/001410/141067e.pdf>)

# Fire

Carlo Teruzzi (Italy)

Willem Hekman (The Netherlands)



## Introduction

### Forest fires

As **South Australia** faces quite often the danger of catastrophic fires, this can happen everywhere and may endanger museums in the area and their visitors.

The green arms of the tall forests embrace Melbourne's east. Mostly this large natural area is considered as a beautiful and benign feature, however on scorching hot summer days in January and February each year, Melbourne holds its breath, for a mere wisp of smoke can herald a fiery horror. It can become a death trap for people caught in the path of a bushfire. Several times last century and again in 2009, severe weather combined with drought created bushfires far beyond the capacity of fire fighters to control, claiming life and property.



Victims of a 1939 fire

Credit: Museum Victoria, Melbourne, Australia

In 2009 the Getty Museum in **California (USA)** has been threatened by a forest fire, but the fire stopped at a short distance from the museum. The staff had already started the emergency plan.

## Fire through electrical problems, smoking, welding, chemicals or other causes



On August 19, 2009 a fire started in the boiler room of the State Library of **South Dakota (USA)** causing extensive smoke damage to the location. The fire was started by sparks from a concrete saw that smoldered for several hours before the fire was discovered around midnight. Reports state that the structure remained solid but that there was extensive smoke damage including damage to the collection.<sup>4</sup>

On September 10, 2009 a drunk electrician fell asleep while smoking, starting a fire at Tetriakov Gallery in Moskow (Russia) in the engineering building which is located next to the main gallery. Technical equipment was damaged and the electrician was hospitalized in intensive care, but it was reported that the Tetriakov with one of the most important collection of Russian art from the 8<sup>th</sup> century through the 19<sup>th</sup> was spared from any damage.

On October 22, 2007 welders were working on the roof of the Armando Museum in Amersfoort (The Netherlands) and caused a fire to the roof of the museum. When the fire started, nobody was in the museum. The museum had no sprinkler system and burned down completely. The whole collection of paintings by the Dutch painter Armando (1929) was lost.



Credit: Nu.nl

### Definition

Fire is a chemical reaction of combustibles, oxygen and heat to an extent of (self) inflammableness. Smoke is a sign of an existing fire.

### Threats

#### Structural

- building materials
- lack of fire compartmenting
- incorrect width of rescue routes
- lack of fire extinguishing water pipe
- lack of water
- absence of detection systems
- obsolete systems
- proximity of dangerous activities
- lack of air lock security

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<sup>4</sup> Credit to Bob Combs, J.Paul Getty Museum



## Management

- lack of investigation about proximity of dangerous activities
- lack of respect about security specifications
- lack of compartmenting of dangerous activities
- lack of check service ability of plants
- lack of designation of a fire prevention manager
- lack of editing of fire prevention plan
- utilization of resistance heaters
- forge-welding works
- utilization of patch cord
- permission to smoke in the building
- switching off security system for maintenance
- storage of flammable and/or combustible materials
- obstructed rescue routes
- lack of exact security signs during maintenance work
- no work with open fire without specific safety measures

## Exhibition rooms

- lack of fire detection systems
- lack of warning system
- use of flammable and/or combustible materials
- temporary electrical plants for exhibitions
- excessive crowding
- malfunction of audiovisual equipments
- malfunction of lighting installations
- lack of emergency lighting plant
- incomprehensible security signage
- lack of evacuation staff training
- lack of fire security staff training
- lack of air lock security on compartmenting

## Storage and laboratories

- uncontrolled accumulation of storage of flammable and combustible materials in high quantities
- uncontrolled accumulation of waste materials in not frequently used rooms
- flammable and/or combustible materials accumulation of residuals materials
- lack of fire detector plants
- lack of warning system
- execution of dangerous activities and works
- storage rooms for dangerous collections with regards to fire
- presence of dangerous equipments and plants

## Checklist

### Decision making ability

- Has a manager been identified with the authority to order the evacuation of personnel and the collections ?

## Museum location

- Are there fire risk activities near the museum ?
- Are there easy ways of access to the museum for assistance vehicles ?
- How many ways of access to the museum are there for assistance vehicles ?
- If the streets are narrow, which vehicle can be used ?
- Are there squares or spaces near the museum where you can deposit objects waiting for vehicles to evacuate ?
- Are there spaces fit to store evacuated objects temporarily ?
- If not, are there contracts with private organizations which have got fit spaces to temporarily store evacuated objects ?

## Museum building

- Are there orientation plans and maps with escape routes for each level ?
- Do the orientation plans clearly locate the dangerous rooms ?
- Is there a fire truck connection ?
- Is there an extinguishing water pipe ?
- Is it possible for the fire brigade to enter the building any time without the assistance of museum staff ?
- Are there portable fire extinguishers ?
- Are there sprinkler systems ?
- Are there fire protection systems verified by law ?
- Do the orientation plans exactly show the position of hydrants and portable fire extinguishers ?
- Do the orientation plans show the location of the emergency exits ?
- Are there any fire detection systems ?
- Is there a warning system ?
- Is there a public address system ?

## Emergency organization

### Protection of human life

- Is there an evacuation plan for visitors and workers ?
- Is there a security and emergency manager ?
- Is the security and emergency manager always available ?
- Are the emergency staff well trained ?
- Do the emergency staff have written procedures ?
- Are fire extinguishing drills done ?
- When was the last fire extinguishing drill ?
- Is there evacuation signage ?
- Are there works in process that modify the rescue routes ?
- Are the evacuation signs been adapted after changes in the rescue routes ?
- Are the rescue routes free of obstructions ?
- Are the rescue routes well lighted ?
- Are the emergency exits according to the law ?
- Are the emergency exits sufficient to address crowding ?
- Are the emergency exits checked periodically ?
- Are the emergency exits normally locked and opened automatically in case of fire ?

- Is the crowding controlled ?
- Is the warning system audible everywhere ?
- Are there works in progress that can take off the warning system ?

#### Protection of collections

- Is there an inventory of collections that identifies the problems about security, transport and emergency plan for the evacuation of objects ?
- Is there an equipment catalogue for transport of objects to a secure place ?
- Is there an emergency plan for the evacuation of objects ?
- Is there a priority plan for the evacuation of objects ?
- Is the fire brigade involved in the evacuation of the collection ?
- Is the fire brigade informed about the exact location of the objects that are to be evacuated ?
- Are there contracts with private organizations for the transport of objects ?
- Are there contracts with public or private organizations to protect the objects stored outside during charging operations ?
- Is there suitable equipment to evacuate the collections ?
- Are there suitable vehicles to reach the charging areas ?
- Are there materials for the transport of objects ?
- If not, are there contracts with private organizations specialized in the transport of objects ?

# Floods

Michael John (Germany)  
Pavel Jirásek (Czech Republic)  
Willem Hekman (The Netherlands)

## Introduction

### Dresden

In the second week of August 2002 large areas of Europe were hit by the severest floods to affect the continent in 150 years.<sup>5</sup> At the highest point of the flood crisis, the inhabitants of Dresden (Germany) were largely left to their own devices. The authorities were not prepared for the catastrophe, and the selfless intervention by thousands of volunteers contrasted sharply with the lack of coordination on the part of officials at all levels of government.<sup>6</sup>

A week after the apex of the flooding, the main tourist area in the center of Dresden had been largely restored to normal. However, just a few hundred meters from the center, parts of streets were covered by ankle-deep, stinking mud. Heaps of rubbish had gathered in front of doorways—bicycles caked with mud, broken furniture, cushions, shelves, foodstuffs, mattresses, coverings torn up from floors—all of it mouldy and rotten.

Flood water precautions on the Elbe are also deficient. The existing system of protection, according to the city authorities, is not adequate for a ‘century flood’ such as that which swamped the city 150 years previously. Their general position was that nothing could have been done. One could only observe the situation and prepare for evacuation.



‘The assembly points must organize themselves. There is no one at the assembly points responsible for coordination. The catastrophe prevention unit will report soon to deploy those willing to help. We thank all those committed people from Dresden and Saxony and their institutions for their readiness to make themselves available at the collection points.’

In other words: there was no advance planning. The intervention during the floods was improvised under the pressure of immediate circumstances and with measures that often expressed a sense of helplessness. According to a leaflet issued by ‘Initiative for Dresden’ one week after the onset of the flood: ‘Essentially, helpers must organize themselves.’

<sup>5</sup> Credit for the article: World Socialist Web Site

<sup>6</sup> Credit for the pictures: State Art Collection of Dresden



It is hardly possible to estimate the long-term consequences of the floods. Along with inevitable environmental problems caused by contamination of water and land, numerous houses are threatened and may have to be demolished.

‘The authorities have told us to clear out our cellars. But how to do it—that’s left up to us. They have not even provided us with containers for the rubble yet, and many of us are not exactly young any more.’

‘Once the catastrophe starts, there is nothing much you can do. These problems can only be solved by long-term planning and town development. Houses and railways should not be built in riverbeds and river meadows. The only real solution would be to tear down whole parts of the city.’



### **Prague**

This happened in Dresden, but it can happen everywhere, like in Prague (Czech Republic) in August 2002.



Situation in Prague, Floods in August 2002

What could be done?

A museum has an emergency team. All the members (let us say that they were five) come to the museum within 30 minutes. As a matter of fact, hopefully they have been on the alert, when the state of emergency has been announced by the local authorities.

Each of them has a clearly defined range of responsibilities, but their tasks were somewhat simplified by the fact that evacuation of persons, which is always very complicated, was not necessary, due to the fact that the museum was already closed to the public owing to the approaching danger. What more could be done?

Further human forces were again convoked, from among the museum staff or volunteers, of course tried and tested ones. First of all, collections and the most valuable equipment were evacuated – either out of the building or to the upper floors.

Doors and windows of the underground and ground floors were barricaded with sandbags. However, evacuation out of the building was soon complicated by roadblocks, constructed upon an order from the city authorities in various places of the town, but not in coordination

with works going on in the museum. Unfortunately, the consequences of this fact were rather disastrous. In a laboratory situated on the ground floor of the building, there was equipment for the treatment of corroded metals, the so-called plasmochemical reduction. It took five hours before two technicians managed to dismantle the equipment, whose value has been estimated to circa 500 thousand USD, and load the parts on a lorry. During that time, the only escape road from the area had been blocked with sandbags, and it therefore became impossible to take the load away. That is why all the parts were moved once more – to the second floor of the building, which took another two hours.



Flooded building with plasmochemical reduction and roadblock

One of the museum store-rooms housed musical instruments – including heavy pianos. The store-room did not allow their being moved into upper storage areas, and therefore they had to be left to their fate. The store-room with historic prints and sheet music represented the biggest problem. There were thousands and thousands of books and musical scores. In another store-room, there was the huge archive of the history of architecture and technology, with large artistic designs of famous historical buildings, including original sketches on large format sheets, stored in metal cases. There were also many old photographs, books and other documentation on the country's technological development. Although they were deposited above the supposed tide level, they were, at least within the limits of the possible, transposed into higher levels of the shelves.

When the water level culminated, it was unfortunately even one meter higher than predicted in the worst hypothesis. The area remained closed for three days, and during the following two weeks, only holders of special permits could visit the flooded areas. These were at first issued by the Ministry of Culture after consultation with the central emergency headquarters, and later also by the corresponding city district offices. It happened in some cases that the city police guarding access roads refused to acknowledge the permits issued by the state authority. The first sight of certain flooded buildings was rather bleak. Water damaged large amounts of collections, some technological equipment and expensive laboratory devices were destroyed; the overall damage has been estimated at scores of millions of USD.

### **Definition**

A level of water in a river or sea which is higher than normal and for which level the building and its environment is not protected.

### **Sources and possible counter measures against floods**

Water threatening the museum can originate from the following main sources:

- surface water like rivers, heavy rainstorms and melting snow
- waste water from the sewer systems
- ground water

Counter measures against surface water:

- up-to-date concept of dams and restraining systems for the rivers
- planning of a mobile system of walls against high water from the river
- installation of bulkheads in the courtyard and the doors of the gallery
- strong seal of all connections of the building under the waterline like breakthroughs for pipes and tubes

Counter measures against waste water from the sewer systems:

- installation of setback-flaps in the sewer system
- additional installation of a strong lock valve in the central imbedding

Counter measures against groundwater:

- installation of sufficient wells with pumps in the basement to reduce the groundwater level
- these wells are decisive for the buoyancy forces

Systems for the elimination of water:

- installation of pumps in the basement to collect water no matter where it comes from (little leakages of the bulkheads or breaks in the water-system, sprinklers, and so on)
- providing equipment near to each of these sources like mobile pumps, electrical extension leads, tubes and connecting pieces
- some pre-installed tubes to prevent the handicap of movements in the walk ways

## **Threats**

Internal:

- location
- bad state of museum building
- inappropriate elements in building construction, like windows in ground floor
- non existence of emergency storage place
- non existence of an emergency plan
- emergency plan is not up-to-date
- lower level of external communication with central/regional/local emergency task force
- lower level of external communication with intervention forces
- lower level of internal communication
- deficiency of protecting materials
- deficiency of transport means
- deficiency of defense materials (bags, sand, water barriers, ...)
- deficiency of freezing space
- deficiency of dryers
- deficiency of disinfection means
- deficiency of conservation means
- no source of clear (distilled) water
- low quality of guards
- low quality of documentation
- no power supply system (back up)

External (city, region, country...):

- global environmental changes
- low quality of urban development
- non acceptance of international treaties in both developing and developed countries
- changes in river/water system development

### **Checklist**

Long term business

- provide risk analysis periodically
- establish a chain of command for the decision to evacuate the museum
- establish and train the emergency team
- inspect the state of the building
- keep the emergency storage place clean for the collections
- keep the emergency plan up-to-date
- provide an emergency plan for 2 situations (situation with enough time to react and an acute emergency)
- keep the transport corridors inside and outside available and clean
- maintain a cooperation arrangement with emergency task forces at the relevant level (local, municipal, county, state)
- have a representative of cultural institutions as a member in the integrated local emergency disaster organization
- submit your emergency to the disaster intervention forces (fire brigade, police) and make the changes suggested by these professionals
- install water detectors (water level monitoring system) in the cellars of the building
- do not keep the heavy collection items (like pianos) in the basement or ground floor
- install the power supply for pumps and other technical equipment
- meet the responsible emergency bodies regularly
- maintain an insurance agreement (if available – according to policy of institution)
- create specific emergency instructions for all the staff, but differently according to the function of an employee
- provide a continual SWOT analysis<sup>7</sup> of your institution for emergency preparedness
- prepare and update the list of conservators for an emergency situation, keep them informed
- secure the places for possible storage of contaminated objects and other garbage
- prepare the equipment for voluntary workers in the event of an emergency

Everyday or periodical business

- follow the weather report
- in case of an emergency evacuate the buildings without any delay
- take into account the changes of the flooding line
- inspect all the emergency information systems (internal to the museum) daily and deeply in recommended periods
- inspect the functionality and availability of transport means
- check the goods carried by the guards before and on duty
- train all the staff for an emergency situation
- inspect disinfection and conservation means (quantity/quality/durability)
- inspect the weak points (and security arrangements there – window shields etc.) in the construction of the building

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<sup>7</sup> SWOT is a method to analyse the Strengths, Weaknesses, Opportunities and Threats of an organization.



#### After flooding

- close the affected area
- monitor and record any movement of staff (and visitors) in the affected area
- ensure the safety of the emergency storage place
- do not pump the water from cellars immediately – consult such operations with a structural designer (changes in statics of the building)
- start to dry exhibition rooms and other spaces of the building carefully
- consult with a conservator on the saving procedures for affected objects
- if the flooded water was dirty or infected (pressure water from sewerage), before following conservation wash the affected objects in clear water
- freeze paper objects (books, manuscripts, archival material ...) immediately and keep them frozen before conservation
- report (and update) all the financial cost of the damages to the director and headquarters of the museum
- inform the press about the damages and financial needs immediately, organize a press conference as soon as possible



Photo from flooded depository of the National Technical Museum – library and archive (Prague, Czech Republic)

# Chemical spills

Sergiu Bercovici (Israel)  
Willem Hekman (The Netherlands)



## Introduction

On February 2, 2010 fire crews have contained a chemical spill at a commercial processing factory in Brisbane's north (Australia). Two persons were taken to a hospital suffering from throat inflammation after two chemicals were accidentally mixed together at the Northgate plant about midday. Factory staff were allowed to go back into the building, but fire crews remained at the site to monitor the cleaning-up<sup>8</sup>.

The range and quantity of hazardous substances used in laboratories require preplanning to respond safely to chemical spills. The cleaning-up of a chemical spill should only be done by knowledgeable and experienced personnel. Spill kits with instructions, absorbents, reactants, and protective equipment should be available to clean up minor spills. A minor chemical spill is one that the laboratory staff is capable of handling safely without the assistance of safety and emergency personnel. All other chemical spills are considered major.

The procedures outlined in this guideline are recommended to apply in all departments, laboratories and facilities in museums where chemicals are used.

This document is only a recommendation for museum institutions to prevent chemical spills, to identify and to evaluate the situation, to prepare an emergency plan and to give a correct and safe response to an emergency situation.

## Definition

A chemical spill is a situation in which a chemical is accidentally released. In the case of non-toxic chemicals, dealing with a spill is usually very straightforward, since the spill simply needs to be cleaned up. However, spills of toxic chemicals represent a more serious problem, especially in the case of spills of multiple chemicals which could react with each other.

## Checklist

The following questions may be helpful to check your risks for chemical spills:

- Do chemical materials exist in your museum
- Do you have an adequate storage place for chemical materials
- Are all chemical materials in your institute registered
- Does your museum use Material Safety Data Sheets
- Are all hazardous materials labelled
- Are all hazardous materials stored in adequate containers

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<sup>8</sup> <http://www.abc.net.au/news/stories/2010/02/02/2808057.html>

- Do storage or/and work places have adequate ventilation
- Do you have safety signs in the areas where chemical materials are stored
- Is the use of chemical materials restricted to laboratories only
- Is all work with chemical materials done only by adequate personnel and under supervision
- Is all personnel trained in using chemical materials before working with them
- Do you have regulations covering the occupational exposure to hazardous chemical materials in your museum
- Are the quantities of chemical materials in storage or/and in work places at a minimal
- Does your museum have an emergency plan for chemical spills
- Do you have appropriate material to contain and clean up any chemical spill in each storage or/and work place where chemical materials are kept or/and used
- Do you have an emergency phone list in the event of a major spill or a highly toxic chemical spill
- Does your museum have an emergency team for dealing with chemical spills
- Is this emergency team adequately equipped for safe interventions
- Does the museum have first aid equipment and trained personnel to apply first aid
- Does the museum have an alert and communications (public address) system
- Does the museum have an emergency energy supply system
- Does the museum have a disposal policy for hazardous materials in case of fire, floods or other natural calamity

### **Emergency plan**

All laboratories and other places using hazardous materials must prepare an emergency plan for chemical spills. This plan must include national and museum regulations and practices for a correct and efficient response to any chemical spill. It must also include the occupancy and location of all hazardous materials in the museum.

The emergency plan provides guidelines and specific procedures relevant to all places with hazardous materials. However, each work or storage place may identify specific requirements and prepare an emergency plan for chemical spills.

The emergency plan must include:

- Collection information methods
- Study and analysis of all information
- Hazard identification and assessment
- The response plan including practices, procedures and materials needed to properly contain and clean up chemical spills
- The responsibility and authority of each staff member
- An emergency phone list
- Material Safety Data Sheets
- Quantity and location of storage and work places of hazardous materials
- A list with the appropriate material to contain and clean up the chemical spill
- A list with appropriate materials to neutralize chemicals
- Appropriate water sources for flushing miscible liquids or water-soluble solids down the drain
- Fume hoods
- Personal protection equipment
- Emergency equipment: first aid station, showers, eye washes

- Fire extinguishing equipment
- Fire alarm system
- Communications system
- Electrical main board
- Ventilation/air conditioning/smoke control systems
- Employee training
- Exercise schedule

### **Immediate actions<sup>9</sup>**

- Clear the area
- Check for any persons involved
- Isolate the spill (if safe to do so)
- Contact the area supervisor or Safety Officer

The primary concern is to protect health and safety. No action should be taken during an emergency response that directly or indirectly violates this principle.

### **Considerations for evacuation**

- Uncontrolled open flame
- Uncontrolled compressed gas release
- Any situation which poses imminent threat to human health or safety

When the alarm sounds, all persons should immediately leave the building and report to their assigned assembly area. Elimination of potential sources of ignition should only be done if it can be accomplished without personal risk.

### **High risk spills**

- Contact the emergency services by calling Security and explain the situation.
- Determine who will take responsibility for the clean-up of the spill, i.e. Contractor, Fire Brigade, other Emergency Service.
- Ensure appropriate museum staff is advised of the situation.
- Follow any advice or information provided by the Emergency Response Team.

### **Low risk spills**

- Have at least 2 trained employees to handle the spill
- Use the proper protective equipment
- Ensure fire protection is available for flammable spills
- Control the source
- Contain free liquids by damming, absorbing if appropriate
- Place all spill residues in an appropriate manner
- Decontaminate the affected area using an appropriate material
- Decontaminate the salvage equipment
- Analyze the area to ensure proper decontamination has taken place
- Examine walkways, floors, stairs equipment etc. for other hazards or damage

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<sup>9</sup> Chemical Spills Emergency Management, University of Melbourne;  
<http://www.pb.unimelb.edu.au/emergency/emergencies/internal/spills.html>

**Debriefing**

- All emergency personnel involved in the spill response should be debriefed (involved in a critical post-operation assessment) after the spill has been resolved.
- All spill control supplies should be restocked.
- All damaged or used equipment should be repaired or refilled.

# Earthquake

Nevra Ertürk (Turkey)

## Introduction

On February 2, 2004, the Zümrüt Apartment in Konya, located in the central part of Turkey, collapsed completely. This catastrophe resulted in 92 fatalities and 35 injuries. The residents of the Apartment thought that it was an earthquake, however, only Zümrüt Apartment shook during the event. Afterwards it was understood that the collapse was not related to an earthquake or other external causes. The main reasons for the collapse and damage were the designed load selection, the inappropriate dimensions of the load-carrying elements, poor material quality and poor soil conditions. Some of the museum buildings in Istanbul also suffered like Zümrüt Apartment as a result of the 1999 Kocaeli earthquake. Although the earthquake was almost 80 km away from the center of Istanbul, some of the museums in the city were affected as they are housed in historical buildings and were not designed as earthquake-resistant structures.



The 1999 Kocaeli and Düzce earthquakes in Turkey, both exceeding magnitude 7, occurred within three months. The death toll exceeded 18,000, over 100,000 buildings were destroyed and financial losses reached an estimated \$10-25 billion (US). Building structures and precast concrete facilities that did not possess sufficient seismic resistance played the most important role in the large losses of life and property. In addition, 50% of injuries and often more than 50% of economic loss is due to non-structural elements. Fortunately, very little damage occurred only in the storage areas of some of the museums during the 1999 earthquakes. The storage areas are not designed as part of the original plan of the historical museum buildings and consequently, storage areas are over-crowded and are not large enough to accommodate the growing number of objects in the collection. In the 1999 earthquakes, some of the objects that were stacked on top of one another collided and broke down, and some of them fell off the shelves and got damaged.

As a result of the Chi-Chi earthquake, magnitude 7.6, in Central Taiwan in September 1999, non-structural damage occurred in many museums. Objects fell down, the electricity broke down and floods came up. Objects made out of paper were soaked, wheeled showcases slid away and unmounted shelves overturned in storage areas. Major earthquakes in the world such as in Kobe (1995), Sichuan (2008), Sumatra (2004, 2009), Haiti (2010) or Chile (2010) also caused damage, both structurally and at collection level, due to the lack of and/or inadequate mitigation efforts against an earthquake.

## **Threats**

Earthquakes cause different kinds of damage depending on the strength of the earthquake, the reach, the type of underlying rock or soil, the building construction or unmounted non-structural elements. The possible threats are as follows:

- non earthquake-resistant museum buildings
- free-standing objects, cabinets, showcases, humidity controllers, air conditioners, fire extinguishers, and all other storage, display and office furniture
- objects standing on an unsecured base
- objects, signs or storyboards hung on the wall with only one nail or objects hung on storage racks from a single point
- objects, lighting fixtures hung from the ceiling with open hooks or hung with inappropriate wires
- unmounted objects, pedestals, mannequins, light bulbs or fluorescent lamps/tubes within showcases
- unanchored or inadequately braced or anchored shelves, storage, display or office furniture
- overloaded showcases or cabinets
- cabinet doors without latches
- unsecured glass such as window, door, skylight, showcase, cabinet glass or shelves made of glass
- breaking of plaster relief or suspended ceilings
- secondary threats such as fire or gas explosion caused by flammable materials, defective electrical wiring or broken gas lines; and water damage caused by broken pipes, ducts, sprinklers, rain, flood or tsunami

## **Checklist (before an earthquake)**

Keep in mind that earthquakes happen when you least expect them and when you are least prepared. So always be prepared and remember the following:

- define the seismic threat of where your museum is located (proximity to faults, site characteristics, building's response, historical and statistical records regarding earthquake)
- survey seismic susceptibility of the museum building (structural integrity of the building and of elements such as added gallery dividers, decorative elements, furniture and fixtures) and of collection both in storage and on display, as well as office spaces and furniture
- develop and regularly update an earthquake preparedness plan focusing on tasks and responsibilities of museum staff before, during and after an earthquake
- conduct periodic training programs as well as drills for museum staff on earthquake preparedness and emergency procedures
- provide an adequate space for the post-earthquake situation
- prepare duplicate records with photographs of the collection at different locations
- have a separate mount-making unit as well as trained staff to produce, install and deinstall adequate mounts or other mitigation methods
- check electrical wiring and gas connections regularly which are potential fire risks and repair them immediately, if necessary
- check for any hazardous materials (poisons, flammable materials in conservation laboratories, office spaces or operating areas) regularly and make sure they are segregated into a separate ventilated and fire-proof area
- check roof, ceilings, foundations, pipes, ducts regularly and repair them, if necessary
- keep items away from pathways and exits that may hinder evacuation

- install outward opening doors, create wide exits and ensure that doors open easily
- cover glass surfaces with security/safety film
- use laminated glass to prevent shattering or cover windows with blinds to prevent falling apart of glass pieces
- fasten showcases, cabinets, shelves and all other storage, display and office furniture to structural elements with adequate methods and safe materials
- secure free-standing showcases with a low gravity point either with a box inside which is weighted or have an access hatch in the rear to add a weight
- reduce the number of objects both in storage and on display to prevent crowding
- fasten objects with mounts, monofilaments (see photos) or a small and appropriate amount of microcrystalline wax depending on the size, weight, material or condition of the object
- fasten hanging objects, signs or storyboards with closed metal hooks
- secure objects with base isolation, if necessary
- place sand or lead bags inside the objects to lower the center of mass, if necessary
- anchor or brace cabinets or shelves
- check shelving capacity and place large or heavy objects on lower shelves
- use cabinets instead of open shelving
- place restraints or netting across open shelves to reduce the risk of objects falling off the shelves, if you use open shelving
- use sturdy latches on cabinet doors to prevent opening
- box or containerize objects with appropriate materials such as acid-free storage boxes, polyethylene foams including ethafoam or polyfoam
- use appropriate padding material such as ethafoam or polyfoam between objects to minimize collision damage and abrasion
- use slanted shelves to prevent boxes from sliding out
- place non-skid mats (that do not emit gas or harmful vapors) both in storage or in office space under small objects to prevent them from sliding out, however, objects must be supported or restrained as well
- secure hanging lights with safety cables, fluorescent tubes to casings and attach lighting to structural elements
- secure tanks with metal chains and fire extinguishers with straps in two places, near the top and bottom

#### **Checklist (after an earthquake)**

- do not use elevators, plumbing or gas until the utility lines have been checked
- do not use matches or lighters until the electrical and the gas system have been checked
- be prepared for aftershocks
- always give priority to museum visitors and staff
- notify the museum security department about the location of the problem (building, floor, room number, etc.), the severity of the situation such as life threatening injuries, secondary threats such as fire, water, building or collection damage
- evacuate the room or the building according to the evacuation plan, if smoke, fire or any other life threatening hazards are present. Do not move seriously injured people, unless they are in immediate danger
- after the emergency situation is over, the decision-makers such as facility managers, head curators, head conservators, head of security should come together to make a quick survey of the overall situation and give decision for further steps about damaged objects, exhibition, storage or office furniture



- take photographs and make a detailed description of the situation, of damaged objects as well as furniture
- report damage and all financial cost of the damage to the director and headquarters of the museum
- organize a press conference and inform the press about the damage and financial needs



Using mount and monofilament

Credit: The J. Paul Getty Museum, Villa Collection, Malibu, California



Using decoupling mount

Credit: The J. Paul Getty Museum, Villa Collection, Malibu, California



Using contour mount and monofilament

Credit: The J. Paul Getty Museum, Villa Collection, Malibu, California

# Terrorism

Sergiu Bercovici (Israel)

## Introduction

Cultural heritage institutes, like any other national symbol, are considered one of the main targets for terrorist activity. Not only that a terror attack may harm the national symbol, but there also exists a high probability of a large number of casualties due to the high concentration of people in such sites.

In September 1997 nine German tourists and one Egyptian were killed outside the Cairo Museum. Two months later, in November, six gunmen opened fire on a group of tourists preparing to enter the Temple in Luxor – 58 tourists and 6 Egyptians were killed. After 9/11 the rate of insurance for museums has risen with 500% because of the risk of terror.



A homemade bomb was the cause of an explosion at a Starbucks on 92nd St. and 3rd Ave. in New York, in the early hours of Monday morning May 25, 2009. Police have no word on the reason for the Starbucks bomb attack and there is speculation that the nearby Guggenheim Museum may have been the intended target.



The bomb was composed of fireworks and an unidentified accelerant and blew out the windows of the Starbucks storefront. Residents of the building that housed the Starbucks were evacuated immediately after the 3:30 a.m. blast.

### **Definition**

Terrorism is the systematic use of power and violence towards random, innocent citizens, performed by organized groups or an individual in order to achieve different targets.

The motivation of a terrorist action may be one of the following:

- national or ethnic conflict
- religious conflict
- political profits
- an attempt to seize the regime
- anarchist action

### **Common terror techniques**

Common terror techniques relevant to the context of cultural heritage institutes:

- ambush
- armed attack
- planted bombs
- biological/chemical
- suicide attacks (New York, September 11, 2001)
- hostage incidents (Moscow Theater on October 23<sup>rd</sup>, 2002 and Beslan school on September 1<sup>st</sup>, 2004 in North Ossetia, Russia)
- kidnapping
- sabotage

### **Who is responsible and for what?**

The entire responsibility in the context of protection against terrorist activities rests on the security forces of the country. Cultural heritage institutes must prepare the security arrangements according to the legal requirements, and guided by security services that are responsible for the implementation.

It is the duty of the security services to instruct, supervise, and handle any terrorist event. The cultural heritage institutes must prepare themselves to these situations by providing passive and active protection measures, guiding the personnel and preparing emergency-situation plans.

At the time of a terrorist event, the cultural heritage institutes must support the security forces, providing any relevant information and technical measures available.

### **Basic components of the security plan**

The preparation of a security plan is the first and foremost important step to bring the institutes to a state of readiness to terrorist events. This preparation is essential in order to give institutes the ability to provide the right answers to every terrorist event, in real time. A threat-assessment should first identify, and then quantify the potential risk. Preventive measures may intercept or discourage the terrorists.

This plan must be simple and the security team must be trained in new risk detection techniques and technologies.

The plan must be dynamic. The security manager and his team must continuously test and examine the security plans and systems with the objective of finding potential vulnerabilities.

Program steps include:

- hazard identification and assessment
- preventive procedures
- answers to possible terrorist scenarios
- feedback loop re-checking for vulnerabilities

### **Critical area protection**

Locations in museums which are potentially dangerous in the context of terror, they must be taken into account in the security plan:

- main entrance
- building proximity
- parking lot
- exhibition area
- restaurant/refreshment room
- ventilation and air conditioning systems

### **Detectable threats**

Threats that can be detected by the security personnel in the institute:

- suspicious mail items
- firearms and other weapons
- suspicious vehicles
- suspicious individuals
- materials that are suspected to be biological/chemical threats

### **Precautionary actions and equipment**

Precautionary actions and the use of technological equipment:

- constructing possible scenarios and corresponding solutions
- passive protection of the institute:
  - laminate existing windows with a 350 micron plastic film or replace the entire window with material that does not produce fragments
  - installation of physical barriers (such as fences, nets, etc.) to prevent the intrusion of people or objects
  - installation of measures that prevent vehicles movement near buildings or crowded locations
  - installation of barriers that prevent the entrance or intrusion of booby-trapped vehicles and bomb-cars to the courtyard or the interior parking spaces located beneath the building
  - installation of visible and invisible (Infra Red) security light
  - installation of CCTV surveillance around the building and the parking lot
- active protection measures:
  - daily search for suspicious objects/vehicles/individuals inside and outside the building
  - access-control

- check entering individuals in a visual fashion and through the use of technical measures (metal detectors, etc.)
- check all items like bags, rucksacks etcetera with X-ray machines
- recording and performing surveillance on individuals' entrance and exit
- checking vehicles in a visual fashion and through the use of technical measures
- material checking and continuous surveillance during structural improvements or construction in order to prevent the implantation of 'sleeping' bombs or the aggregation of weapons and explosive materials (the assassination of the Chechnyan president and the Beslan school case)

### **Inspection procedures**

- inspecting individuals:
  - outer circle identification of suspicious individuals by security personnel, based outside the building entrance
  - checking entering individuals outside the building through the use of hand detectors or metal-detector gates
  - creation of a sterile zone between the individuals who were checked and the individuals who were not
  - it is recommended to use turnstiles to allow an individual inspection, creating a distance between the examined individual to the individuals standing in line
  - in order to avoid the crowding around the location in which the security inspection is performed, it is recommended to provide numerous check points which are distant from one another, and in the field of vision of the incoming visitors
- inspecting vehicles:
  - any vehicle that is supposed to park in a closed space or next to the building must pass a security inspection
  - the security inspection should be performed between two barriers that are able to prevent the breaking of vehicles
  - barriers should be installed on the parking exit as well
  - check for suspicious items inside and outside of the vehicle

### **Identification procedures**

- signs of suspicious individuals:
  - inappropriate dressing
  - shaking hands/touching the face/nervous
  - sweat/blush
  - impulsive movements
  - shining eyes
  - mumbling
  - blood vessels showing

- signs of suspicious mail items:<sup>10</sup>
  - is there any powdery substance on the outside
  - is the mail unexpected or from someone unfamiliar to you
  - does it have excessive postage, handwritten or poorly typed address, incorrect titles with no name, or misspellings of common words
  - is it addressed to someone no longer with your organization or otherwise outdated
  - does it have no return address, or one that can't be verified as legitimate
  - is it of unusual weight, given its size, or is it upside down or untypically shaped
  - does it have an unusual amount of tape
  - is it marked with restrictive endorsements, such as 'Personal' or 'Confidential'
  
- signs of suspicious vehicles:
  - car identification plate
  - intelligence information
  - vehicle's visible content
  - breaking in signs
  - suspicious driver/passengers
  - lower back side of car (heavy trunk)
  
- signs of suspicious object:
  - unfamiliar to place
  - unknown owner
  - of unusual weight, given its size
  - suspicious contents
  - visible content: boxes, pipes, batteries, wires, mobile phones
  - liquid leak from the bag with combustible smell

### **Reactions in case of events**

- main steps:
  - identification of threat
  - evacuate the area and report to security authorities
  - isolate the threat
  - search by qualified personnel for other suspicious individuals/vehicles/objects/materials
  - threat of an imminent event
  - declaration of event termination
  - back to routine
  
- suspicious objects:

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<sup>10</sup> Credit to U.S. Postal Service

- be alert for objects that are out of place, freshly painted places, disturbed dirt, replaced ceiling tiles, objects recently moved, broken cabinets and electric cables
- do not touch anything
- do not change the situation in the area
- do not use mobile phones or walkie-talkies
- evacuate the area and report to security authorities
- look closely in the area, near doorways
- stay away from windows, electrical equipment, showcases
- be prepared for a possible explosion
  
- suspicious vehicles:
  - do not touch anything
  - do not use mobile phones or walkie-talkies
  - evacuate the area and report to security authorities
  - stay away from windows and power lines
  - go to the nearest safe place
  - be prepared for a possible explosion
  
- suspicious mail items or chemical/biological materials:
  - do not handle the mail or the chemical/biological suspicious materials
  - shut down the air conditioning or ventilation system
  - close the room's windows and doors
  - isolate the people who had contact with suspicious mail/materials
  - as soon as possible, take a shower with soap and water
  - evacuate the area and report to security authorities

### **Hostage situation**

- if you hear or see a hostage situation:
  - immediately remove all people and yourself from any danger
  - report to security authorities
  - remain calm and keep things calm
  - don't change the situation
  - don't excite the hostage taker
  - convince the hostage taker to allow medical treatment or to release the sick or injured hostages
  - talk with the hostage taker
  
- if you are taken hostage:
  - remain calm, be polite and cooperate with your captors
  - do not complain, avoid being belligerent and comply with all orders
  - do not draw attention to yourself with sudden body movements, statements, comments or hostile looks
  - do not attempt to escape unless there is good chance of survival
  - try to stay low to the ground or behind cover away from windows or doors



- in a rescue situation:
  - do not run; drop to the floor and remain still
  - make no sudden moves
  - wait for instructions
  - even if you are handcuffed and searched, do not resist

### **Decision making in an event**

When security personnel faces one of the previously described situations, ad-hoc difficult decisions must be made. For example, one can decide to evacuate the place. What alternatives does she/he have?

1. Postpone the evacuation instruction until state's official security personnel arrive to the scene, so they can examine the situation and respond.
2. One can choose to declare immediate evacuation of the place, leading individuals to a safe location, until state's security personnel approve returning to the routine. This action is the safest in terms of saving lives.
3. Order evacuation, and concurrently start the search using trained and instructed teams. Through the use of this option, valuable time for dealing with the actual threat can be used, so property will also be saved. The disadvantages are putting the security team at a high risk.

The process of making decisions must be an integral part of a response system, one that has to be approved by both the institute's management and state's security institutes. Through these approvals, the person taking the decisions in-site is released from the heavy pressure that comes from the great responsibility of real-time decision making.

### **Checklist**

- in general:
  - do you have the police and other security authority's telephone numbers posted/handy
  - do you have a plan for a terrorist event
  - do you have a first aid kit
  - do you have a terror alert information from security authorities
  - do you have instructions for a terror threat situation
- exterior circle:
  - is the yard area completely fenced
  - is the fence adequate and in good physical condition
  - do you have adequate physical barriers and gate
  - are the yard area and the buildings adequately lighted at night
  - do you have a closed circuit TV around the buildings
  - do you have an exterior intrusion detection system
- interior circle:
  - do you have numerous check points and more than one entrance and ticket booths for visitors
  - have you spread out the check points, entrances and ticket booths over the area and not concentrated on one point
  - do you have a metal detector gate
  - do you have an X-ray screening machine
  - do you have a daily inspection in the exterior and interior circles for detection of suspicious objects, cars etc.
  - do you have laminate windows with 350 micron plastic film

# Museums under threat of bomb and rocket attacks and war

Sergiu Bercovici (Israel)  
Willem Hekman (The Netherlands)

## Introduction

War and Museums are two antagonistic (conflicting) words. War refers to a state in which people are hurt, and damage is inflicted, either explicitly or implicitly. Museums, on the other hand, refer to the storage and protection of human achievements throughout history, for the purposes of education, culture and heritage.

Three case studies to illustrate the paradox.

The National Museum of Iraq was established by the British author Gertrude Bell and opened in 1926. It was originally known as the Baghdad Archaeological Museum.

Closed in 1991 during the Gulf War, out of fear of further US air-strikes it was not re-opened until April 28, 2000.



National Museum of Iraq<sup>11</sup>

In the months preceding the 2003 Iraq war, starting in December and January, various antiquities experts asked The Pentagon and the UK government to ensure the museum's safety from both combat and looting. Although promises were not made, US forces did avoid bombing the site.

On April 8, 2003 the last of the museum staff left the museum. Iraqi forces, in violation of Geneva Conventions, engaged US forces from within the museum, as well as the nearby Special Republican Guard compound. Army uniforms were later discovered in the building. Iraqi forces had built a fortified wall along the western side of the compound, allowing concealed movement between the front and rear of the museum.

Thefts took place between April 10 and 12, when some staff returned to the building and fended off further attempts by looters to enter the museum until US forces arrived on April 16.

While the staff instituted a storage plan to prevent theft and damage (also used during the Iran–Iraq War and the second Gulf War), many larger statues, steles, and friezes had been left

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<sup>11</sup> [http://en.wikipedia.org/wiki/National\\_museum\\_of\\_Iraq](http://en.wikipedia.org/wiki/National_museum_of_Iraq)

in the public galleries, protected with foam and surrounded by sandbags. Forty pieces were stolen from these galleries, mostly the more valuable.

In addition, the museum's aboveground storage rooms were looted; the exterior steel doors showed no signs of forced entry. Approximately 3,100 excavation site pieces (jars, vessels, pottery shards, etc.) were stolen, of which over 3,000 have been recovered. The thefts did not appear to be discriminating; for example, an entire shelf of fakes was stolen, while an adjacent shelf of much greater value was undisturbed.

The third occurrence of theft was in the underground storage rooms, where evidence pointed to an inside job. Evidence indicated that the thieves possessed keys to the cabinets but dropped them in the dark. Instead, they stole 10,000 small objects that were lying in plastic boxes on the floor. Of them, nearly 2,500 have been recovered.

### **The Middle East, 2006**

In the summer of 2006, a new Middle-East war took place, inflicting tremendous damage. On the 13<sup>th</sup> of July, 2006, at 20:00, the first rocket hit mount Carmel, 30 meters from the Carmelite's monastery. From that point on, and for a period of a month, dozens of missiles landed in the area of Haifa. They landed in the National Maritime Museum area, where the Museum of Art in Haifa, the Mane Katz Museum, and the Japanese Art Museum are located. A rocket that landed on the last day, landed next to the City Museum, its shards hitting the structure walls.



Haifa Museum of Art<sup>12</sup>

### **Looting and destruction in the Kabul Museum<sup>13</sup>**

When rockets slammed into the National Museum of Afghanistan in Kabul in May 1993, a fire melted supporting beams holding up the ornate vaulted roof, sending it crashing down on the upper galleries. The next day, Najibulla Popol, the 37-year-old museum curator, peddled his bicycle through the fighting to the shattered building. He and a few staff members transferred what they could salvage to vaults in the museum's basement.

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<sup>12</sup> [http://lmuseums.com/museum\\_eng.asp?id=3](http://lmuseums.com/museum_eng.asp?id=3)

<sup>13</sup> [http://en.wikipedia.org/wiki/Kabul\\_museum](http://en.wikipedia.org/wiki/Kabul_museum)



But the destruction of the museum building and part of its collection – the sole comprehensive record of Central Asian history – was only the first stage in a larger tragedy. In the months following the first rocket attack, a stream of Mujahedin soldiers repeatedly breached the steel doors of the vaults and systematically looted their contents, often guided by detailed instructions from Afghan and Pakistani antiquities dealers. In January 1994, when the United Nations agency Habitat bricked up the museum’s windows and repaired the doors, the move only appeared to encourage more looters to break in. When new padlocks were again installed in March 1995, soldiers simply shot them off.

The National Museum of Kabul caught fire in May 1993 after rocket attacks. The second floor of the museum was completely abandoned. Except for a small number of artefacts, they lost all of the showcases and the screens that were used for exhibitions.

### **In general**

In this chapter I <sup>14</sup> will share some of my experiences. These include the preparation of the museums, and the operations that were executed in order to prevent possible damage to the exhibits presented in the museums throughout Israel, and Haifa in particular. The environmental state to which I am referring is a constant short rocket/missiles attack to the town centers.

### **General instructions**

- museum visitors as well as the museum’s personnel must carry out the army instructions during the event of bomb or rocket attacks
- the security guards must have a safety shelter
- verify that the fire extinguishers are all in a working condition and that the area around them is not obstructed
- verify that the escape route is clear and the escape doors are not obstructed
- verify that all communication channels are active and safe for communication, in order to be able to communicate with the museum’s personnel and security guards
- make sure that the museum’s copy of the inventory as well as a copy of the priority objects list are safely placed outside the museum (e.g., a bank, Ministry of Culture, etc.)
- reduce the usage of both electric and gas appliances; after usage, make sure to check that all are closed down
- all inflammable materials should be brought outside the museum and its surrounding areas
- locate the main water valves and mark them on the maps and in the streets

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<sup>14</sup> Sergiu Bercovici (Israel)

- cover all window panes with transparent film, up to 350 micron thick for prevention of glass fragments in case of explosion
- verify that the first aid box contains all required equipment

### **Preparation for the state of war**

All museums are obliged to have emergency programs. The main clauses of the program include:

- an up-to-date documentation of all of the exhibits
- an organization, regulations, and the division of responsibilities
- preparation of a safe place for the exhibits
- improvements of the museum's defense – prevention of glass scattering as a result of the shock wave
- store museum catalogues and the documentations in a safe place outside the museum
- any exhibits that are not easily ready for transfer due to either weight or size must be protected in situ
- prepare a list of guard companies, have signed contracts so that these will react in the time of need
- prepare a contact-list with army officials, the police, the fire-department, the rescue forces, and of course, the museum personnel
- prepare a list of volunteers
- train and practice the evacuation of people and exhibits to a safe place
- implementation of the defense against rocket attack regulations when constructing new museums
- organize protection in order to prevent the plundering of the museum, in case of a hit
- prepare regulations for returning to the routine

### **Recommendations for exhibitions and collections**

- all items that can be damaged by blasts must be taken down from the exhibition, wrapped up and stored in a safe place
- glass, ceramics and other breakable items must be taken down from the exhibition, wrapped up and stored in a safe place
- remove and store in a safe place all items which are near the windows
- remove and store in a safe place all items which are not placed under a reinforced concrete ceiling and wall
- remove and store in a safe place all valuable items, at the discretion of the museum management; a safe place for people may be considered as a safe place for the items as well
- storage of museum items in underground places necessitates placement on shelves 15 cm above ground level, at minimum; also, one should check that a good drainage exists
- temporary storage for museum items must be according to the following conditions:
  - reasonable physical protection against bomb/rocket attacks and theft
  - without water, drainage or sewage pipes
  - without inflammable, explosive, oxygenated or corrosive materials
  - without a biological threat
  - maximum temperature of 24° C and a relative humidity that does not exceed 65%
  - a good locking system (we suggest that the lock would be changed to a new lock); this lock must be marked with a secret sign
  - have an armed guard equipped with a communication device

**Prevention of plundering**

- call the police or the army for help
- prepare a list of security companies
- mobilize museum staff for searching the museum items in the ruins
- close the museum area to all unauthorized people; the guard should be placed in the exterior circle. Access to the ruins area should be approved by the army and engineering authorities and by them only.

# Building facility risks

Rob den Rooijen (The Netherlands)

Willem Hekman (The Netherlands)

Michael John (Germany)



What to do if you have problems with your museum building?

## Introduction

Because a building shelters the museum's most important priorities it can be seen as the first and strongest line of defence in an emergency or disaster. But when a building is poorly equipped or maintained it can cause or worsen emergency situations. So when you're having a small problem with your building it can easily become a big trouble for your collection or organization.

## Asbestos in the Rijksmuseum Amsterdam<sup>15</sup>



In April 2003, the Rijksmuseum in Amsterdam, one of the most popular museums in The Netherlands with more than a million visitors a year, had to close indefinitely after asbestos was found in the building during a routine inspection. Officials decided to close the museum,

which contains one of the largest collections of Dutch art, including Rembrandt's *The Night Watch*. It was closed until further notice as a precaution, also for the 400 members of the staff.

After two weeks a small part of the building was safe to be opened again.

### **The Blanding museum**

Damage from a burst water pipe forced Blanding museum to close in November 2004. Gushing water from a ruptured water pipe flooded the Edge of the Cedars State Park Museum in Blanding, Utah on Tuesday afternoon, forcing officials to close the museum for at least three months. A spokesman said that a pipe joint connection in a section of the museum's fire suppression system was not properly crimped when it was installed more than 25 years ago. The system was inspected two weeks before, and no problems were detected. The pipe joint burst, releasing a torrent of water that damaged walls, flooring and display cases on the ground level and first floors of the museum. An estimated 18,000 gallons of water (68.000 litres or 68 tons) poured from the pipe in the 15 minutes it took park staff to shut down the system's main water valve.

### **The Albertina museum, Vienna**

In June 2009 Vienna, Austria experienced the heaviest downpours in 50 years, causing damage to the underground depot of the Albertina museum.<sup>16</sup>

The staff removed 950.000 artworks from the leaking depot to another location in Austria.



### **Threats**

- electrical wiring does not meet code standards
- emergency generator or power back-up systems are not available
- fire department personnel are not used to the building
- inadequate fire, smoke or water detection
- malfunction in climate systems, cooling, heating etc.
- no actual building and construction drawings
- not enough technical budget
- only single water and electricity supply
- poor insulation from asbestos which is present in the building
- poor housekeeping
- problems with the foundation of the building
- technical staff and knowledge are outsourced
- unprotected IT systems and software
- water and gas pipes in bad condition

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<sup>16</sup> <http://en.wikipedia.org/wiki/Albertina>

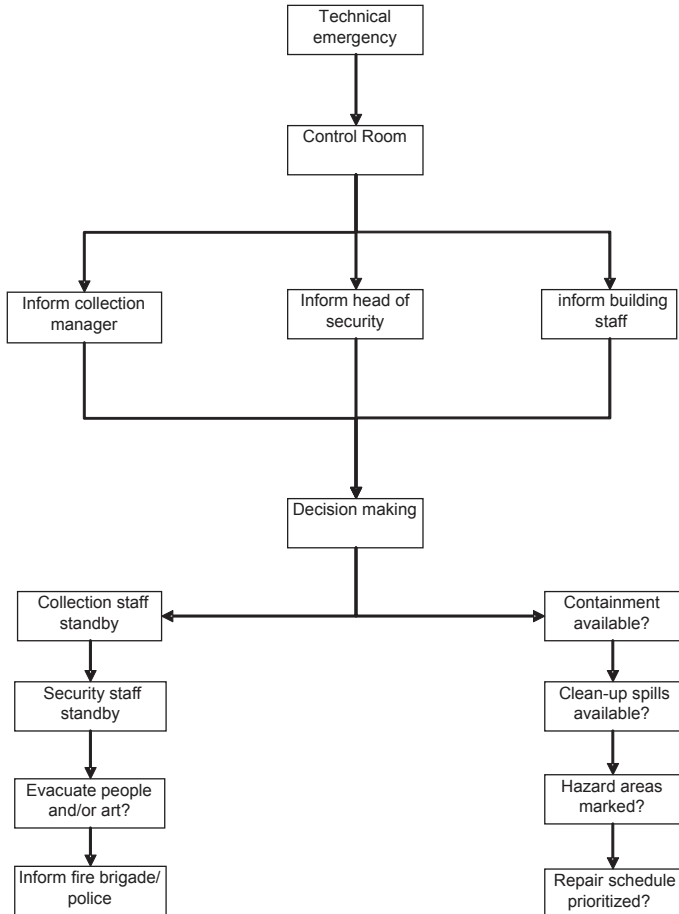


### Checklist (preventive)

- are stairs and banisters secured
- is emergency back-up lighting available throughout the building and regularly tested
- is the museum totally dependant on a local utility for power
- does the museum have dual or redundant power supply lines
- are the plumbing work and electrical wiring well maintained, inclusive service contracts
- is there a risk induced by the presence of asbestos in the museum
- do the electrical circuits and boxes meet code standards
- is a technical staff available
- are there service contracts for climate systems
- are the IT systems well protected
- is the Fire department personnel well trained in the building
- are actual building and construction drawings available
- is the building part of the emergency plan
- are weight statistics for the floors available
- is the use of scissor lifts for the work on artworks in the exposition halls in accordance with the weight capacities of the floors
- are the pipes for the rainwater and the tanks waterproof and clean of debris and do they have enough capacity to serve the drain purposes
- are the roofs capable to carry the snow which can be expected
- are the lightning conductors in place and effective

### Instructions (during the event)

A typical emergency procedure in case of a technical emergency situation





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