

## Natural Disaster Cooperation and Solution (Floods in Prague 2002)

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### *Resumen*

#### ***Desastres naturales - Las inundaciones de Praga (2002): cooperación y soluciones***

*Aunque algunos museos estén equipados con las instalaciones esenciales necesarias para hacer frente a situaciones de emergencia, una deficiente evaluación en materia hidráulica puede, por ejemplo, hacer completamente estéril toda la labor preventiva realizada anteriormente. Sólo un sistema bien preparado de cooperación con el personal de los museos y con otras entidades nacionales e internacionales permite reaccionar de manera eficaz y adecuada contra los desastres. Las inundaciones sobrevenidas en Praga en 2002 constituyen un ejemplo de esto. En efecto, pocas horas después de que se produjeran, se puso en marcha un plan de limpieza, desinfección y secado, en colaboración con un equipo especial del Ministerio de Cultura. No obstante, cabe señalar que no sólo es preciso respetar las etapas cronológicas definidas previamente, sino que su ejecución debe subordinarse al objetivo que se debe cubrir, sin olvidar otras cuestiones importantes como la de la seguridad de las colecciones durante las operaciones de carga, transporte y descarga.*

### *Résumé*

#### ***Les catastrophes naturelles - coopération et solutions (les inondations de Prague de 2002)***

*Bien que certains musées soient équipés de l'essentiel des installations nécessaires pour faire face à des situations d'urgence, une mauvaise évaluation hydraulique par exemple peut réduire à néant les efforts préventifs faits en amont. Seule une coopération bien préparée avec le personnel du musée et avec d'autres institutions nationales et internationales est susceptible d'apporter des réponses efficaces et adaptées. Les événements de Prague en 2002 en sont une bonne illustration. En effet, quelques heures après les inondations, un plan de nettoyage, de désinfection et de séchage a été mis en place en collaboration avec une équipe spéciale du ministère de la Culture. Cependant, les étapes des phases chronologiques identifiées au préalable doivent être respectées et mises au service du processus d'action à mener, sans oublier la sécurité des collections pendant le transport et les chargements.*

Let me start my presentation with the words of someone else - Olavi Elo, Director General of the Secretariat of the International Decade for Natural Disaster Reduction:

“Unfortunately, most people in the world view natural disasters with fatalism. They think that nothing can be done about them. The attitude is understandable but wrong. We have to try to change it. There is, in fact, a great deal that can be done to save lives and limit the damage”.

Imagine the following situation. You are a museum director, or the curator of a large collection; as usual, you have stayed at work longer than the others. It is Friday, in some countries the day before the long awaited two-day weekend. Over the past few days, you have been following, with a certain degree of fear, the raging floods in the lower reaches of the river crossing your town. You know that several historical monuments have already been affected, that some of your colleagues have already recorded losses; in brief, you have an idea of what the water may do. But you have worked on the prevention of emergency situations in your museum for a long time now. Your museum is very well equipped with various efficiently operating monitoring systems. There is a quite new intruder detection system. Selected dust-proof showcases in the exhibition are protected day and night by a very efficient electronic alarm system. The fire alarm system is linked to the extinguishing system. Both the exhibition and storage rooms are equipped with a monitoring system checking critical physical parameters. All the information from these systems is collected in a central control room operating twenty-four hours a day. The fire alarm system signal is linked to the appropriate city fire brigade, the output from the intrusion system is transferred to the relevant state police station. The professional level of your security staff is good, everybody has clear instructions on what to protect and how to act in various situations.

However, you may now find yourself confronted with a new situation, and that is flood. Over the past three days, you have done everything possible so that your museum does not suffer a fate similar to that of your colleagues' institutions. It was mainly the early warning and time needed for the water to cover the distance of several hundred kilometres that gave you a chance to be well prepared. In cooperation with hydrologists, following their reports, all the museum staff and many volunteers have worked ceaselessly to evacuate collections and construct anti-flood barriers. According to the latest reports, the water will rise as high as the so-called five-hundred-year level, i.e. seven metres above the normal water level. Since you are very careful, you have ordered that all collections from the ground and underground floors be taken to the upper floors, so that even if the water rose to a height of 7.5 metres, nothing serious would happen to them.

It is 7 p.m., you are ready to leave, when the phone suddenly rings. The central headquarters announce that there was a mistake in the hydrologists' calculations and that because of draining to release overloaded retention ponds where dams were likely to burst, the river level will rise by the next day to 8.5 or 9 metres, instead of the expected 7 metres above the normal level. There are plans for the area where your museum is located to be evacuated the next morning; the area will be disconnected from underground services and closed without any possible access.

Does this sound crazy? It certainly does, but it happened. Some museums in the Czech Republic had to face a similar situation in last year's catastrophic floods. And I would now like to share some of the experience from our efforts to solve the problem. The theme of this section is "Networking: coordination and collaboration among diverse institutions and organisations in emergency preparedness and response."



General View of Prague, flood 2002

Without cooperation with well-prepared members of the museum staff, other institutions and components of the so-called integrated emergency system, the museum professional from my previous example would have had very few options. But as a skilled museum person can deal with any situation, he did not panic and started to act. He started to act, because he had to find a solution.

His first step was to convene the museum emergency team. All the members (let us say five) came to the museum within half an hour. In fact, they had been on alert for more than a week, since the state of emergency had been announced for the river zone.

Each had a clearly defined range of responsibilities, but they still announced every decisive step to our hero. Their task was somewhat simplified by the fact that there was no need to evacuate persons, which is always very complicated, as the museum had already been closed to the public because of the approaching danger. What more could be done? Further human forces were called in, from museum staff and volunteers, of course tried and tested ones. First the collections and most valuable equipment were evacuated again, either out of the building or to the upper floors. The doors and windows of the basement and ground floor were barricaded with sandbags, but evacuation from the building was soon complicated by roadblocks set up at various points in town on orders from the city authorities, but not in coordination with work at

the museum. Unfortunately, the consequences of this were somewhat disastrous. A ground floor laboratory housed equipment for the treatment of ageing metals, the so-called plasmochemical reduction lab, and it took five hours for two technicians to dismantle the equipment, valued at approximately US\$500 thousand, and to load the parts into a lorry. During that time, the only escape route from the area had been blocked with sandbags, and it was then impossible to take the load away. So all the parts were moved yet again, to the second floor of the building, which took another two hours.

One of the museum storerooms housed musical instruments, including heavy pianos and it was impossible to move them to upper storage areas, so they had to be left to their fate. The storeroom with historic prints and sheet music was the biggest problem; there were thousands and thousands of books and music scores. Another storeroom held the huge archive of the history of architecture and technology, with large artists' drawings of famous historical buildings, including original sketches on large format sheets, stored in metal cases. There were also many period photographs, books and other documents on the country's technological development. While they were already deposited above the water level forecast, they were, whenever possible, transferred to higher shelves.

The news broadcast by radio and television was chaotic. Over several hours, starting with the mayor's speech trying to reassure citizens by saying that the river would only come out of its bed in a few areas, the forecast changed several times, and gradually the first orders were given to evacuate entire districts of the city. Helicopters were flying overhead and traffic in the streets was chaotic. Fortunately, there was no looting anywhere. Whole areas were closed off later and the water came out of the riverbed. The museum people were called to leave the buildings immediately. The police and army took control of the closed area.



Libechov Castle, flood 2002

When the water level reached its peak, it was unfortunately one meter higher than expected in the worst hypothesis. The area remained closed for three days, and for the following two weeks, only holders of special permits could visit the flooded areas. These were first issued by the Ministry of Culture, after consultation with central emergency headquarters, and later by certain district offices in the city. In some cases 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 had damaged large parts of the collections, some technological equipment and expensive laboratory devices were ruined; the overall damage has been estimated at millions of US dollars.



Libechov Castle, flood 2002



Libechov Castle, flood 2002

Damage control was launched immediately after the disaster let up. In practice, that meant stopping destructive processes set off by the catastrophe. The first problem to solve was the process of disintegration affecting damaged books and paper documents. Within seventy-two hours after the water went down and before mould could start developing on the books, they had to be cleaned, removing dirt mechanically, disinfected when possible, wrapped and frozen to a temperature of minus twenty-two degrees Celsius. This was for hundreds of cubic metres of material. Many other collection items had to be cleaned, disinfected and dried as well. Disinfection was necessary because a lot of collections were flooded with waste water from sewers. It was later discovered that the water pressure even caused the sewers that had been closed for centuries to flood, so the objects were contaminated with very old, but still live and dangerous bacteria. Part of the equipment and collections had to be written-off and liquidated, as they were impossible to restore. The water had reached as high as the second floor and the carefully dismantled plasmochemical reduction equipment was ruined.



Central Storage in Terezin, flood 2002

The museum, of course, was not left alone to deal with renovation work. A coordination team was set up at the Ministry of Culture, with all the Blue Shield representatives. It coordinated the flow of subsidies from the state budget allocated by the government to cover flood damage, and supported other cultural institutions helping their colleagues. In parallel,

representatives from each sector were updating financial needs and gathering information on the requirements of the institutions damaged. This information was centralised at the Ministry of Culture and processed as material submitted for government negotiations. According to existing possibilities, the government distributed funding for repairing water damage via the budgets of different ministries.

Today, it can be considered that the preparedness and efficient cooperation between the different sections of the Blue Shield, the damaged institutions and the Ministry of Culture made it possible to implement this level of support through the government. In fact, it covered the needs of the museums, monuments and libraries, so that within less than one year, all the institutions affected were operational, including the museum cited as the example at the beginning of this presentation. Moreover, all prerequisites were set up for most of the damaged collections to be conserved, restored or replaced in a satisfactory way.

Let us now try to analyse the overall situation, stressing the strong and weak points of the internal and external cooperation needed by the museum cited above with other components in the safety system. This will highlight the general rules of cooperation when preparing for emergency situations.

The time phases, corresponding to emergency situations as consequences of a natural disaster (but this could also apply to war) can be divided into five basic periods.

The first is the time from the museum's normal operation until the state of emergency is declared. During this stage, the museum's security system is built on an approved security policy, the purpose being to ensure the protection of collections and other museum property, protection of visitors and staff and the protection of the reputation of the institution. During this stage several measures are adopted by the museum to eliminate risks. The most important sub-elements of the system are listed below:

- mechanical barriers;
- the system of organising guards;
- organisational measures for staff and visitor behaviour;
- organisational measures incorporated in the exhibition or interior design;
- intruder detection system (IDS);
- fire alarm system (FAS);
- access control system (ACS);
- closed-circuit television (CCTV);
- internal communication and reporting of emergencies measurement and regulation of critical physical parameters (temperature, humidity, intensity of light and UV radiation);
- measurement of technical parameters (water, gas, dust);
- internal and external lighting;
- protection from excess voltage generated by atmospheric forces;
- internal monitoring centre (control room);
- transmission of alarm data from the monitoring centre to the relevant intervention forces;

- textual and visual documentation of cultural objects, their registration and logging in the inventory;
- emergency plans, evacuation plan for both people (staff and visitors) and collections;
- cooperation with intervention forces;
- cooperation with relevant national and international organisations and agencies;
- priorities for conservation and restoration.

Let us say that our museum had defined its security policy properly and that risk reduction through a security system had been one of its long-term priorities. Furthermore, as member of ICOM and the museums association, it made use of help provided jointly by these organisations gathered together in the national committee of the Blue Shield.

The Czech Committee of the Blue Shield was founded in 2000 through an agreement concluded between the organisations representing museums (ICOM), archives (ICA), libraries (IFLA) and historical monuments and sites (ICOMOS). In 2001, the Committee concluded an agreement with the Ministry of Interior, represented by the Emergency Fire Brigade, covering cooperation and joint action within the framework of the Integrated Emergency System of the Czech Republic (IZS). The cooperation involved preparation and execution of rescue work during fires, natural disasters and other emergency situations affecting cultural heritage. The agreement defines information and executive links, including a list of contact places, persons and resources that can be used by both sides to safeguard cultural heritage. The museum had developed an emergency situation plan, including a flood plan. In cooperation with free-lance experts, the police, fire brigade and no doubt colleagues from other cultural institutions, an analysis was conducted of possible risks, setting priorities in the museum security policy to be adopted and laying down the emergency situation plan. The plan, however, did not have provision for such large-scale flooding. This was of course a mistake, although quite an understandable one.

I would now like to set aside flood and emergency solutions to touch on broad rules for drawing up emergency plans. In general, it is essential for such a plan to include all possible emergency situations that may eventuate in the museum, both natural and anthropogenic. In simple terms, natural disasters cannot be avoided; one has to learn how to live with them. By adopting measures, their unfavourable consequences can simply be contained. However, the occurrence of anthropogenic situations can be reduced considerably through appropriate preventive action.

Natural disasters that have to be taken into account could be described as short-term, being caused by immediate climate changes or other quick changes in the vicinity of the museum. In addition to floods, there are storms, earthquakes, droughts, volcanic activity, dust storms, huge fires and other events. The probability of such emergency situations occurring is relatively small, but the consequences of their occurrence can be catastrophic.

The second type of natural environment impact is the creeping danger. This does not have an immediately disastrous effect on a given subject, but the probability of it occurring is high, sometimes even permanent. In

the long run, it can lead to the destruction of the element affected. This category includes inadequate levels of humidity, temperature and lighting.

Anthropogenic situations, i.e. influenced by human activity, are mainly unlawful acts and accidents inside and outside the museum: theft, robbery, damage, arson, vandalism, sex crimes, bomb threats, terrorist attacks, riots, war, in brief everything humans have invented to mutually disturb one another and sometimes even destroy lives.

Accidents are the most frequent occurrences. Events such as physical injuries, the failure of technological systems and monitoring systems are incidents that can appear from time to time in the everyday life of any institution.

An important, though often neglected point on the agenda is the security of collections during transport and loans. The general principle should be that the level of protection of collections on loan should be the same as or higher than it is in the home institution. It is important to pay proper attention to loan contracts as well as to the legislation of the country of destination of the loan (e.g. state guarantees and possible claims from other subjects).

The solutions to all these situations, and perhaps many others, should be found in the museum's emergency plan.

Another crucial stage is mostly the unusually short time between the declaration of the state of emergency and the onset of the emergency situation. In that period, our museum did its best. Both staff and volunteers (who were found and tested via the central emergency IZS headquarters) sealed off all possible entrances to the buildings and evacuated the collections and other property belonging to the institution. As soon as the state of emergency was declared, the museum was closed to the public. The museum's emergency team was activated, equipped with mobile phones, the connection was checked and phone numbers updated. Incidentally, this is very important: just try to find out how your phone directory of outside partners works, or even how the directory for your own museum staff works — you may be quite surprised. Another action was to appoint a single museum member of staff as a contact person providing information to the media.

The poor coordination of street work in the city was obviously a problem, and the only evacuation road from one of the museum buildings was barricaded with sandbags. This was the problem for evacuating the plasma reduction equipment which, as a consequence, was destroyed. But there was also the precious time spent by several museum staff members for complicated dismantling work in the critical hours before the flood reached peak level. The hydrologists' forecasts were wrong, as was the assessment of the situation by the mayor of the city, at first trivializing it, then constantly changing the reports; (this later cost him his position as mayor). But none of the museums affected by the flood dared take the bold step taken by the Hilton Hotel which, to avoid flooding with dirty wastewater from the sewers, deliberately flooded its own basement with clean water before the wave hit. That certainly spared them a lot of inconvenience.

Before the areas were closed off by the police and army, the official representatives of these law enforcement bodies were notified of the need to conduct permanent patrols around the museum buildings to ensure the security of the collections. (The emergency team members themselves stayed on duty for 24 hours in one museum building which had the "misfortune" of being outside the flood area.) As the water rose, it was clear that the situation would be worse than expected. The most critical threat was the condition of the flooded book collections. Similar problems also affected some archives and libraries, i.e. other Blue Shield sectors. A joint effort was made to find a cooling plant where the damaged collections could be deep-frozen for long-term storage. The emergency team was in constant contact with IZS emergency headquarters. This time was also used to replenish all stocks of washing and disinfection agents, wrapping materials and protective aids.

The next phase of the emergency situation was treatment immediately after the flood let up. As soon as the water level dropped, and while the area remained closed for a long time to other inhabitants, the Ministry of Culture issued special permits, authorising entrance to selected museum professionals who began the initial treatment of the damaged collections, together with volunteers sent to the museums by the central emergency headquarters. This was mostly cleaning and disinfection. Damaged objects were doused in water again, but this time it was clean. The more sensitive materials were obviously given priority. Immediately after the flood, representatives of the institutions affected working in the Blue Shield held a meeting to coordinate the most pressing issue which was the deep-freezing of damaged books and paper material. For cultural heritage, this was approximately one thousand cubic metres. Having reached an agreement with an industrial cooling plant, a standby cooling complex was set into operation and the material was transported in refrigerated trucks. There were hundreds of them, fully loaded. In record time, it was possible to conserve not only the collections of the cultural institutions, but with the available capacity, also the archives from other affected branches. The most badly damaged part of the collections had to be written off.

The next phase of the emergency situation is the subsequent liquidation of damage and the return to normal, which has been continuing up to the present. As mentioned in my introduction, joint action by the affected museums, archives and libraries made it possible coordinate foreign help according to different needs and, even more importantly, to undertake joint efforts leading to the government's decision to adopt the renewal of flooded cultural heritage as a priority, and providing an adequate level of financial support as needed.

As I have tried to show through one example of an emergency situation caused by a large-scale natural disaster, cooperation with all sectors concerned in the rescue system always pays off. For both developing and updating emergency plans, it is essential to note a clear division of tasks both inside and outside the institution, and the coordination of rescue activities has to be ensured, in particular with the police and fire brigade; this should be stated in a written agreement, if possible. The experience of being confronted with a flood also showed that while one should rely mainly on one's own forces and inventiveness, it is equally important to develop sufficient forces and means for implementation. A well-prepared

emergency plan will simplify the decision-making process. It should be noted that during major disasters the safeguarding of cultural heritage will not be a priority as the first priority is always, and rightly so, to save human lives. It is also important that everybody should do what is best to help solve the immediate situation. The ambassador of a certain country went selflessly to help clean one of the flooded museums; of course it was reported in the newspapers the next day. However, if he had remained seated in his office and made several phone calls to rich potential sponsors in his own country who could have made an immediate contribution of urgently needed financial support, his help would have been much more effective in the long run. But that would probably not have made the newspapers.

Preparedness to deal with emergency situations does not only concern floods, of course, but all kinds of threats to museums. Every kind of emergency situation has to be dealt with in the emergency plan. If you intend to develop or update the plan soon, I would recommend the very well prepared materials of the J.P. Getty Museum and ICMS publications as a source of inspiration. Emergency plans are often discussed at yearly ICMS conferences too, and I would like to invite you most cordially to attend them. All the details can be found on the ICMS Web site: [http://user.chollian.net/~pll/public\\_html/icms](http://user.chollian.net/~pll/public_html/icms)