

**Minutes from working Group 3 meeting in Stockholm 2004.06.10 – 11**  
Preliminary

**Participants:**

Steve Emery English Heritage UK  
Einar Karlsen National Board of Antiquities Riksantikvarien Norway  
Seppo Pekurinen Federation of Finnish Insurance Companies Finland  
Kalle Reivila National Board of Antiquities Finland  
Simon Singer Main de Paris France

Kerstin Westerlund National Property Board Sweden Chairman  
Per Rolle'n National Property Board Sweden day 2  
Helene Hanes National Property Board Sweden day 2

Anders Carlsund St Erik Försäkring AB (insurance company Ltd for Stockholm) day 1  
Thomas Erenmalm National Heritage Board Sweden day 1  
Olle Norrby Brandgruppen AB day 1  
Bo Palmqvist Legal, Finance and Administrative Services Agency  
Johan Renvall Brandgruppen AB day 1  
Torbjörn Thede'en Royal university of Technology day 1

Technical visits:

Marie Edman Franzen National Property Board  
Kerstin Hagsgård The Royal Collections  
Ann Britt Larsson National Property Board  
Håkan Lundblad The Royal Collections

**Place:** The meeting took place in the headquarter at National Property Board Packhus gränd 5 in Stockholm Old Town

Website to COST 17 is [www.cost-cl7-heritage.org](http://www.cost-cl7-heritage.org). Internet address is for contributions to cost is [info@risk-consultant.com](mailto:info@risk-consultant.com)

**Main subjects of the meeting.**

The main purpose of the meeting was to discuss and get new knowledge and information about:

- Risk (assessment, evaluation), analysis, consequence and measures to take
- Principles about the insurance companies approach to cultural heritage and the possibilities for change

-The ethical aspects of loss recovery including its impact on authenticity

### **Risk (assessment, evaluation), analysis, consequence and measures to take**

*Risk; concept, analysis, perception in theory Prof Torbjörn Thede'en*

Torbjörn T defined the concept of risk as a combination of events with negative *consequences* (including loss of economic, historic or emotional *value*) and the corresponding *probabilities*. Sometimes one mainly considers the probabilities, sometimes the consequences and in many cases their product. Contrary to traffic accidents we have in the case of historic buildings (and also for nuclear reactors) no or very little data available. The historic buildings are also unique which is not the case for other systems. We then have to use incident data which should be standardized to be of use. Further on risk analytic methods, a combination of logical models and data for components (parts) of the buildings, could be used. In some way one must value losses of parts or all of historic buildings in order to be able to prioritise the safety measures to be undertaken. This is of course more a political question.

Summary.

- Build data bases of incident data. These should be standardized between the countries.
- Use risk analytic methods (fault tree and event tree analysis). That means make logical systems instead of using statistics
- Define probable hazard scenarios including sabotage and terrorism.

Also cultural historical value including its economic impact and consequences must be defined.

Statistics must be based on a large number. Limited data is not useful for discussions about priority and can lead to false conclusions.

### ***Risk analysis and measures to take in practice* Civ ing Olle Norrby and Johan Renvall Brandgruppen AB**

The intentions in the Swedish Rescue Services Agency general code is to identify the fire risks and make an overall assessment of the consequence of fire.

Risk analysis is an extensive and precise analysis of a situation.

Risk assessment is a more overall estimation.

*A more thorough risk analysis can be required for buildings:*

- of special cultural historic value
- built with combustible material
- containing a large number of people or valuable items
- where considerable amount of flammable materials are kept

When we talk about an historic building the first step must be to *identify the historic value* of the building and its different parts.

For buildings in general use, *the activities* in the building, its fabric and the structural features and its surroundings, etc. The probability of ignition and the distance from the fire brigade shall be described and analysed.

*The main sources of risk* for the analysed building have to be identified. Generally they are; rebuilding and reparation works, arson, open fires, kitchen and kitchenette, electric installations, lightning and outside fire.

Then *probability of fire* depending on the different risk sources can be ranked.

The *consequence of fire* is the loss of value economic, historical, aesthetic and emotional  
The consequence of a fire depends on:  
-how quickly the fire is discovered

For buildings in general also *the activities* in the building, its fabric and the structural fittings etc and its surroundings, probability for lightening and distance to the fire brigade shall be described and analysed.

Another parameter to take into account is the possibility of restoration.

Olle N described the practical measures to take for the 17 th century building Läckö, how the systems and organisation has to be developed according to the buildings special conditions. The costs for protecting Läckö with are estimated to 4,4 milj Skr. Appr. 400.000 Euro

#### ***Case studies Johan Renvall Civ ing Brandgruppen AB***

Johan R described "the risk analysis and suggested measures (organisational and practical) to take" for the Bonde Palace in Stockholm, a private palace from the 17 th century today used for the supreme court.

As a whole the work was completed as detailed above. The definition of the historic and emotional value was one main reason to protect the building against fire and was basic in the document. The values of different rooms were shown on blueprint. Measures to take in case of fire were described for all of them, what to save etc. An assumption about to what extent a reconstruction would be carried through with regards to the historic value was stated as a base for the estimation of the costs to rebuild the building in case of fire.

When deciding what measures to take in case of fire, an estimation of the costs for reconstruction were made to allow discussions with an insurance company about what protection would be needed to get a reasonable insurance fee. The costs were based on the assumption that the facades, the roof, the main entrance halls and rooms classified as 1 must be reconstructed as a whole with use of the original forms, materials, colours and decorations. Rooms classified with 2 and 3 can be redesigned but with the same aesthetic quality and standard as before. The building is not insured by a private company. The state insurance does not work with a special sum insured for each building.

Important problems were that the building:

- is just one big fire cell
- the heavy traffic directly up to its walls can cause a fire

On the other hand it is situated close to the fire brigade

The result was a suppression sprinkler system in the attic ???

Johan R promised to make a short summary of his speech

### ***Cultural heritage evaluation as factor in risk evaluation Kerstin Westerlund SFV***

The decisions about the extent that cultural historic heritage buildings, listed buildings and buildings owned by the state or the community should be protected against fire are political. Therefore we have to work in a systematic and transparent way.

In the National Property Board every property manager has to:

- define the cultural historic value and relate it to history in what we call “care program” for all historic buildings
- carry through risk analysis for the historic buildings (still in the beginning)
- make plans for their work with fire safety for carrying through different steps in the safety work (including already taken measures)
- describe the goals for the fire safety work in the care program

The definition of the historic value and the priority to save the building related to it must be the base for the risk analysis. To convince the property manager to take the right measures to save the building there must be a hypothetic discussion about the value and the costs for reconstruction and the demands for protection an insurance company might have. Also the value for the surrounding society, the region or the whole country has to be considered

KW showed the National Property Board attempt to make decision about the priority between buildings

### ***Discussion/Conclusion***

Torbjorn T objected to that. He said it is OK as in page one systematically in figures graduate the different aspects as risk consequence (economic and historical value) and probability (evaluation of sources of risk including special circumstances, such as the possibility of the fire brigade suppressing the fire). *But it is making it too simple to get the priority by multiplying the figures used to graduate the different aspects.* And where is the economic value for the owner and society?

Time dimension in analysis is important in probability.

*Basic in risk analysis for an historic building is:*

- to use the definition of the historic and emotional value of the building as a whole as starting point
- to state the value for society and make a hypothetic decision to what extent reconstruction will be asked for if a fire would occur
- to estimate the costs for reconstruction related to decision about reconstruction
- to discuss that with the insurance company

*To be aware of:* To store flammable items in a historic building is very bad also to use it as kitchen. Electricity enlarges the risk very much

*Measures to take are very different if the building is:*

- used and to what purpose
- not used at all or with no people in it
- situated close to the fire brigade or far away in the countryside

Steve Emery told about the **Building Fire Performance Methodology** as follows;

One way of determining the likely affect of fire on a building and its contents is to use the 'Building Fire Performance Evaluation Methodology', otherwise known as the 'Method', a system developed in America.

This involves looking for the room that seems to be the highest fire risk.

It is then assumed that a fire occurs which has enough energy to spread and involve the whole room (flashover). Whether this occurs or whether it just burns out will depend on the amount of combustibles, how close they are to each other, the available ventilation, the volume of the room and the ceiling height.

These factors and the flammability of the contents of the room will also give an indication of how quickly it will reach full room involvement.

A judgement is then made as to the probability that the fire will spread to an adjacent space and then the probability that it will involve the whole floor and then the whole building. This can be judged by looking at the fire resistance of the partitions ceilings and doors.

The time taken for fire to spread from the room of origin will also depend on the fire rating of these various elements of structure.

The time taken before an intervention, such as first aid fire fighting, or tackling by the fire brigade is then assessed by looking at the following factors;

- How quickly will the fire be detected
- Is automatic detection provided and is it heat or smoke activated?
- How long will it take before first aid fire fighting commences?
- Is there a 24-hour presence so that first aid fire fighting can be instigated?
- If there is not a 24-hour presence is the fire alarm monitored so the fire brigade can be called automatically.
- How long will it take for the fire brigade to attend? This will vary according to the time of day, whether they are full time or retained, the distance from the fire station, the traffic conditions and the ease of access.
- When the fire brigade arrive, the time taken before water can be applied to the fire. This will depend on how close the fire engines can get to the building, the available water supplies, the distance that hoses will need to be laid between the water supplies and the fire engine and between the fire engine and the fire.

If the total time taken from a fire starting to the point that fire fighting begins is longer than the time taken for the fire to spread beyond the room of origin, then some remedial action needs to be taken.

*It is important that the owner of the building really understand what is the value of the building including what it means to people. The economical dimension of the historic value has not to be forgotten.*

Steve Emery told about St Albans cathedral, which had a quantitative fire risk assessment undertaken, based on information about 29 fire incidents between 1711 and 1997.

Seppo P told that in Finland 100 people die in fire, that means costs for society of 100 milj Euro. To save historic buildings also save the life for people and money for society.

### **Technical visit to the Royal domain in Drottningholm Palace and Theatre**

*Marie Edman Franzen from National Property Board* described the risk analysis behind the fire protection and the regulations for the use in the still working old 18th century theatre (with inner walls of papier mache'). Kerstin W informed about the documentation going on of the palace building.

Kerstin Hagsgård from the Royal Collections showed us the palace interior. She demonstrated their attempt to create lists with photos and data of the precious items housed in the various rooms. They are meant to help the salvage team to know what to bring in safety if there is a fire.

### **Friday 2004.06.11**

#### **Principles about the insurance companies approach to cultural heritage and the possibilities for change**

##### *Insuring practices and principles in Finland Seppo Pekurinen Loss prevention manager*

In Finland the churches are insured by a private insurance company. But it varies how. It can be full value covering the expense of rebuilding. It can be a certain amount insured. It is usually based on market value. Most companies offer additional fees to amount insured which as an example could cover reconstruction with traditional material and constructions.

Very often new demands from the parish make reconstruction in the old way inappropriate. An example of that is the fire in the church Rantasalmi in 1984. It was insured to an appropriate amount. The parish wanted premises for a new use. A very high aesthetic quality was asked for. Good enough to win the National Visual Awards but not to save the historic dimension as a whole.

The Church Tyrvää is an example of the importance of taking measures to save what is left after a fire. But the amount of money for restoration was limited.

The three different fires in the old Opera in Helsinki in 2003 was caused by garbage stored close to the facade.

For decision about the insurance fees for churches a classification system is used:-

P1	P2	P3	Complexity
“Stone”	“Brick+wood”	“Wood”	Material
P11	P21	P31	Simpel building
P12	P22	P32	Normal building

P13	P23	P33	Exceptionel building
P14	P24	P34	Monumental building

When the church is insured to a certain amount the premium rates could be as an example:  
 0,5‰/m<sup>2</sup>            1,3 ‰/m<sup>2</sup>            2,2‰/m<sup>2</sup>

When the church is full value insured the premium might be:  
 0,8‰            2,0‰            3,5‰

For the church of Rantasalmi the fee was 1,2% and the insurance amount 3,0 ME

To that an *additional premium* could be added as; inside decorations 10-20%, traditional material and structure etc, No lightning conductor adds the premium with 0-20 %

Insurance companies offer incentives to enhance protection. Generally all measures that increase the safety of the building lower the insurance fee.

The following can decrease the premium; Sprinkler 30-60%, smoke or fire detection 20-30 %, empty water systems 10-20%, surveillance systems 10-20%, out door light 10-20%

The worst cause of risk is: arson, fraud, fire, lightening, electricity, heaters, hot works, burglary, fraud.

***Insurance of historic buildings in Stockholm Anders Carlsund managing director CEO***

St Erik Försäkring AB (Insurance company Ltd) is one of 16 companies owned by the city of Stockholm. It is the only one that does not have a political Board. Its share capital is 100 Milj SKr. All insurance except life insurance has to go through St Erik. St Erik is responsible for the risk?

The company has its own reinsurance program. It makes it independent from the very shaky insurance market and instead it can go directly to the reinsurance market. The city of Stockholm, Gothenburg, Oslo and Gävle/ Sundsvall all work in the same way.

46.000 people are employed by the city. 200 buildings are owned by the city. Most of them have great historic value.

*Text from insurance conditions Property insurance ST Erik Försäkring*

”Full value insurance with guaranteed reinstatement is applied for the object type buildings. First loss insurance can also apply for buildings if this has been agreed and is stated in the insurance policy. The insurance applies with the sum insured that are stated in the insurance policy with regard to each type of property.-object type”.

13.1.1”With regard to buildings with documented cultural and historical value or artistic value, the insurance also covers additional expense because the building cannot be reinstated in a rational way, but with a maximum of 50 prise base amounts or an amount stated in the insurance policy???. The cost of the loss does include additional costs that are due to expending measures, e g repairs carried out on overtime, or transport by other than normal means.

The loss costs include additional expense – up to 50 price base amounts 46.000 skr or an amount stated in the insurance policy- caused by the fact that a damaged building must, in accordance with decision by the authorities or environmental requirements or standards that apply to buildings, be given a different structure or design than before the loss”.

13.1.1.1 ”If the building has decreased in value as a result of age, wear and tear and obsolescence by more than half the replacement value at the time of the loss, the loss will be assessed at the cost of the reinstatement, although at most to be decreased value resulting from age, wear and tear and obsolescence.

Note

The replacement value at a given time is understood to mean the cost that would have arisen if the building had been completed as new at the time. The value shall include all costs that are necessary to be able to put the building into service”

13.3.1.2. ”With amendment of the regulations in 13.3.1 but with application of 13.3.2, a loss concerning property of antiquarian, cultural, historical and artistic value will be assessed at the cost of repairing the damaged object without delay if that is possible, or acquisition of newly-made object of equivalent artistic quality. Property referred to here shall be specially documented (e.g. photographs) and specified in a separate inventory list. The relevant documentation shall be stored so that it cannot be destroyed in conjunction with the property being damaged”.

The city hall is insured at first risk. It is unlikely that more than apart of it will be destroyed in case of fire. On the other hand is the reconstruction costs properly estimated to its full price?

A functional reporting system (incidents and fires) is necessary. It has been a long way to reach it. Incitements have been necessary for that. You lose money if you do not report. That way you can form your own conditions.

***The situation in United Kingdom Steve Emery***

The insurance industry in the Unite Kingdom is the largest in Europe and is the third largest in the world. It employs 354,000 people and accounts for 20% of investment in the stock market. It pays out £50 million per day in general insurance claims.

There are 654 Insurance Companies authorised to carry on general insurance business and the largest 10 property Insurers account for 85 % of the market. These are:-Norwich Union, Royal and Sun Alliance, Zurich Financial Services, AXA, Allianz Cornhill, NFU Mutual, Churchill Group and Ecclesiastical Insurance. The insurance groups do not currently make a profit on the premiums they collect as shown on the table below.

Net Premiums	£7.5 billion
Total Claims & expenses	£7.6 billion
Underwriting profit	- £0.1billion

The sum insured is the maximum amount the insurance company will pay in the event of a claim. It is the owners responsibility to ensure that the ‘sum insured’ meets the full re-building costs

*First Loss*

To reduce the insurance premiums it is possible to insure under the First Loss principle. This is the sum insured to cover the maximum loss estimated by the insurance company, which includes rebuilding in the style of the original. This only covers accidental fires starting in one place. This would allow a cathedral, for instance to insure for the loss of one roof only, where the masonry tower would effectively stop a fire from spreading to the other roofs.

*Under Insuring and Percentages*

If a building is under-insured the insurance company may impose a percentage reduction in respect of any claim. e.g.

A building destroyed by fire with a rebuilding cost of £1.000,000, but only insured for £500,000 is under-insured by 50%

The maximum payout would be 50% of the sum insured. i.e. £250,000.

The cost of insuring private houses is based on the rebuilding costs. The following chart shows the rebuilding costs per metre associated with houses from different periods, whether they are large medium or small, the area of the country and the typical area in square metres. It can be seen that some adjustment is made for the age of the property, but it may not be enough for a full restoration in traditional materials.

Region	Pre 1920			1920-1945			1946-1979			1980-date		
	Lg.	Med	Sm.	Lg.	Med	Sm.	Lg.	Med	Sm.	Lg.	med	Sm.
1	937	1002	1022	894	938	962	741	806	830	734	733	
2	822	879	897	784	823	844	650	707	728	644	643	
3	775	829	846	739	776	796	650	667	686	607	606	
4	731	782	798	698	732	751	613	629	648	573	572	
Typical Area M2	320	155	120	237	127	98	578	126	98	224	131	

In Great Britain an educational trust has been set up after the death in a fire of a well known Member of Parliament, Colvin. His son set up the Colvin Trust to promote fire safety awareness and the need for adequate insurance to owners of historic country houses.

### ***Insuring state owned property in Sweden Bo Palmqvist***

Bo P told that because of the COST 17 project, a discussion is being held to find a way of insuring cultural historic property to an appropriate amount. The description of the way the state owned property is insured in Sweden is available in the activity WG 3.3.2 Describe the principles behind the insurance companies work with historic buildings. It is enclosed to this document.

Fire incidents has to become reported to the Legal, Finance and Administrative Services Agency

### **Discussion/Conclusion**

**The group agreed on the key questions for better awareness about the consequences of fire and for improved possibilities to save cultural heritage for the future is :-**

- awareness about the cultural and financial value of historic buildings among property owners and insurance companies
- special registration of cultural historic buildings in the registers of the owners and a special discussion about these buildings with the insurance company
- awareness about the real costs to reconstruct an historic building from owners and insurance companies
- insurance fees based on sound statistical data, degree of protection and more exact estimation of reconstruction costs
- demands on the owner of different specified protection of the buildings appropriate to every special situation
- attention from media on the insurance amounts and protection asked for

For the management important questions are:

- incentives to protect the property against fire (technically and organisational)
- a functional fire reporting system
- education of the tenants
- proper documentation of the property is needed. It has to be saved outside the building.

To reach the reconstruction costs for complicated rooms and buildings is a difficult work. Some body have to begin collecting data.

### **Loss recovery; impact on authenticity, The ethical aspect: Technical visit to the Royal Palace**

***Analysis of the fire risks and an overview of the intensions how to protect the building***  
*Ann-Britt Larsson Deputy property manager National Property Board*

Ann Britt demonstrated the risk assessment behind the measures taken in the Stockholm palace. The palace is 50.000 m<sup>2</sup>. Its cultural historic value is extremely high. What can be done to protect it against fire has to be done in steps depending on what is practical.

The worst risk factors are identified as:

- attics
- basements
- electrical installations
- kitchens

Kitchen and electrical installation rooms have a sprinkler system. All stored items are taken away from the attics and some places in the basement. Fire security was one reason for building a new big store for the Royal Collections in a separate building at Drottningholm.

An automatic fire alarm and detection system is installed throughout. New fire resisting partitions have been created between rooms. There is no intention to sprinkle the attics because all the combustibles have been removed and compartment walls have been provided.

The Royal Palaces are owned by the state by National Property Board. The king has by law? the right of disposition. The office of the governor upholds and maintains that right related to The National Property Board. The Royal Collections is responsible for all items belonging to the King and the Royal Household.

Technical visit; .

We found one electrical central in the attic that some of us thought should become built in. Ann-Britt L guided us through parts of the palace along winding back staircases, along the very clean attics and the parade apartments, to one of the many guest rooms for prominent people

Håkan L showed a new way to hang a valuable tapestry to get it easy to remove.

***The mobile salvage wagon*** was demonstrated by Reidar Almqvist, Ann-Britt L och Håkan L. It contains the equipment needed for salvage work after a fire. Water pumps, big waterproof clothes, helmets, high visibility waistcoats, basins for collecting water, tools. It has its permanent place in the the stables of the court one hundred meters from the Royal Palace.

***What can be done on site as fire prevention and to minimize the damage in case of fire, the loss recovery.*** Håkan Lundblad Intendent The Royal Collections

Håkan L described the inventory work going on to make lists with photos. Than the salvage teams will handle the practical aspects. The list shall be placed in each room. Priority is given in the way that only the very valuable or important items are depicted on the list. But so far there is no priority between these valuable or important items. The group stated that it must be important to decide priority also between these.

Only the staff of the palaces and the fifteen appointed contact persons (see below) has these lists at hand. For security reasons the lists can't be in the rooms for everybody to study.

In case of fire the visitors and the staff have to be evacuated before the items. It has to be an appointed leader on site who tells where to begin taking out valuable items. When the fire brigade arrives their leader decides if and where it is possible for the staff to go on with the salvage of furniture and art.

There is a list of 15 experts to ask how to handle the items in case of fire as help for the people working with salvage of the items. It did not seemed quite clear how these were

supposed to act. It was discussed whether it would be possible to create some sort of neighbour group interested in coming to help with the practical work to give first aid and protect valuable items. Per Rohlen promised to handle material from the organisation of salvation work in Schönbrunn to Håkan Lundblad.

How to avoid theft was discussed. Everybody can buy an orange vest and a helmet. there is a need for some identification.

Håkan told that some years ago there was a lot of activity in the Royal Palace concerning training of the staff, regular inspections and a clear organisation. Today after the death of Olle Johansson there are problems with uncertainty about responsibility, who is the salvage leader on site, it has been a long time since the last training exercise with other institutions. The organisation will be made clear during autumn

Bo Palmqvist offered the insurance service from Legal, Finance and Administrative services agency

### ***Conclusion about the ethical aspect***

Kerstin kolla SFV policy???