

Condition survey of paper collection of National Archives

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1. Introduction

Large condition survey and risk management project was performed between May 2008 and August 2009 at the National Archives of Finland. Around 0,85 % of all paper collections was surveyed by 14 conservators during one year. From around 2.1 million archival units around 17.000 archival units, meaning bindings or content of boxes, has been surveyed. Methodology of this survey is one of the widest among surveys of paper collections. The survey also utilises the archival databases of National Archives in a sophisticated way.

2. Methods

Methods can be divided in three categories. Visual damages were estimated. With chemical analyses both the condition and type of papers were investigated. Risk analyses among storage rooms and collections were performed. Common to all methods is that the results of all individual tests has been rated with numbers 1 – 3 and 0 – 3, where the rating 3 indicates the worst situation.

Visual condition survey informs the overall condition of items. Condition of the collections is rated in six different damage categories and three damage rates. The first four damage categories inform about chemical damages (biological, humidity, ink/media damages and yellowing and dirtyness of paper) and the last two about mechanical damages (physical damages of paper, binding damages). The damage rates indicate the severeness of the damages. Rating 3, the worst, indicates severe damage with acute need for conservation treatments. Rating 2 indicates moderate damage with need for conservation treatments and rating 1 slight damages with no need for conservation treatments. Rating 0 indicates naturally no damage at all.

Simple chemical tests indicate the condition of paper and also characterises the papers according to their types (hand made rag paper, paper from chemical pulp etc.). Estimating the paper pH with two indicator solutions is fast method which gives accurate information enough to categorise the results in four ratings, 0 (best) neutral or alkalic, 1 near neutral, 2 slightly acid and 3 (worst) very acid. Traditional manual double-folding test was used to indicate the mechanical strength of papers. Lignin test (florogucinol) and Graff-C fiber analyse will characterise the paper type to rag paper (rating 0), paper made of bleached chemical pulp (rating 1), paper made of unbleached chemical pulp (rating 2) and paper made of mechanical pulp (rating 3). One to two samples of each archival unit surveyed were chemically tested.

Thorough risk analyses of the storage facilities, climate, storage materials, shelving and use of collections were also included in the condition survey.

The results of the survey are collected to a specific database, where both statistics and results from thorough searches can be done. For example, the condition survey results can be reflected against the manufacturing period and raw materials of paper. As well it is possible to search changes in one or more specific damage category and rate in different time periods or storage rooms. The results of risk analyses will indicate the life expectancy of collections.

3. Results and discussion

One of the first results which were noticed while the survey was going on, was the fact that the brown lignin containing storage boxes widely used in Finland are acidifying rapidly. Lowest pH readings were 3,8 – 4,2 in boxes which were 30-40 years old. Rapid contacts to the Finnish paper industry and box making companies resulted a Finnish made archival quality cardboard for boxes in summer 2009. Also the quality standards for use of cardboards with collections to be stored permanently will be updated in spring 2010.

Visual damages %	0	1	2	3
Biological	94,6	3,4	0,8	1,2
Humidity	92,8	6,3	0,8	0,1
Inks, media	77,2	21,7	1	0,1
Dirt, stains, yellowing	11,7	71,7	13,7	2,9
Physical	37	51,8	9	2,2
Binding damages	66,3	26	5,8	1,9

Table 1: Amount of visual damage rates in percentage

Of visual damages 1,2% of the collections was having mold problem. In percentage the amount is small, but in number of units it is enormous, reflecting that about 25.000 archival units would be needed to treat by conservators. Most of the other visual damages relate to physical and binding damages as well as dirt, staining and extra materials attached (tapes).

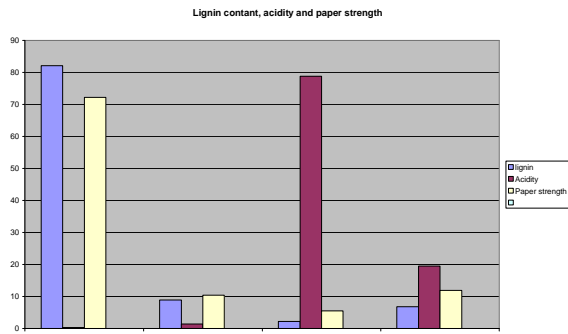


Table 2: Lignin content, acidity and paper strength

Chemical analyses informed that most of the papers are slightly acid. That was not surprising. More surprising was that about 20% of the samples were very acid, but only 7% had high lignin content (mechanical pulp). Amount of fragile paper (10%) is also lower than the amount of very acidic paper, but high acidity and paper fragility do not necessarily correspond. It is good to know that the majority of our paper collections are of rag and chemical bleached paper (90%). The results reflect, that the causes for higher amount of very acid papers to be expected could be due to rapidly acidifying storage boxes.

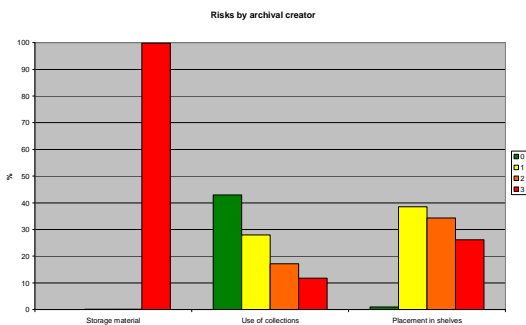


Table 3: Risk by archival creator

The storage boxes used are all made of mechanical pulp containing cardboard. The use of collections as well as placement in shelves causes risks as seen in Tab. 3.

	0	1	2	3
Safety	78	38	53	10
Water damage	31	39	105	4
Cleanliness, materials	30	62	59	28
Quality of shelves	116	1	53	9
Climate, day	50	71	22	27
Climate, week	27	50	34	59
Climate, year	60	63	47	0
Permanent temperature	0	7	157	6
Permanent humidity	159	10	1	0

Table 4: Results of risk assessment in 170 storage rooms

4. Conclusions

The final results of the survey will give deeper information of conditions and risks in storage rooms, the material content of collections, the use of collections and most of all of the damages found to help the planning of conservation and digitisation strategies at the National Archives of Finland. From the final results Conservation Action Plan will be created and fulfilled during the strategy period of 2010-2015.