



Management planning for historic ships

L. Malmberg

The Vasa Museum, Sweden

Abstract

The purpose of the paper is to discuss the need for management plans when preserving historic ships. The emphasis will be on the work related to the *Vasa*, but other ships will also be discussed.

The reason for a management plan for the *Vasa* is to ensure that the ship is preserved for the future. To a certain extent, it is easy to list a number of things that will have to be done more or less forever to preserve the ship. A constant climate has to be maintained, a cradle will have to support the ship and a certain amount of maintenance and documentation will be needed.

The difficulty lies in the less obvious preservation issues and in creating a situation favourable for preservation. There is always the risk that the ambition of preservation decreases, if it is felt that the situation is under control.

To a certain extent, this happened at the *Vasa Museum* in the early 1990s. The ship had its new building, a climate plant was installed and the PEG-conservation completed. Surely, routine maintenance would be sufficient for the future.

Now, some 10 years later, the situation is different. The climate plant is being renewed, salt precipitates (sulphur) are a serious treat to the ship's future, and the stability of the polyethylene glycol is far from certain. The mild steel bolts, installed to keep the hull structure intact, are corroding and acting as catalysts for the sulphur.

Many problems that have occurred during these 10 years were impossible to anticipate, as there are few comparable objects that can be used for references.

The conclusion is that working within a management plan would not have stopped things happening to the ship, but should have seen us better equipped to deal with the problems. Focusing on a preservation programme and relevant research will hopefully make a difference for the future.



1 The Vasa

When the Vasa embarked on her disastrous maiden voyage in 1628, no one could have anticipated that the ship would sink, and that she would become the centrepiece of one of Sweden's most successful museums more than 300 years later.

When the ship capsized, many thought that the ship would soon be salvaged. However, it soon became apparent that this was impossible with 17th century technology, and so the Vasa was slowly forgotten.

In 1956, Anders Franzén discovered the ship, and once again plans for her salvage were discussed. These first management plans were not easy to formulate. Such a large and old wooden wreck had never been raised before, and a number of different ideas and methods were considered.

This situation has indeed followed the Vasa ever since. There are few archaeological wooden ships of Vasa's size and complexity. Planning for her future and survival has often signified working with unknown parameters.

The first management plans were successful. Many discussions took place, both in various boardrooms and in the media, as there were no self-evident method to start with. A strong leadership was needed, not perhaps to decide what ideas were the best, but to ensure the progress of the project. The head of the salvage operations proved to be such a leader, and the operation progressed rapidly, even if opinions differed a lot during the salvage.

After the ship was raised, the wet oak of the hull and the thousands of objects had to be investigated, documented and preserved. Also, a way of housing the ship and displaying her to the public had to be envisaged.

Much of this was accomplished in remarkably short time, and in 1961 the first museum, Wasavarvet, opened to the public.

This did not mean that the Vasa was by then a finished product. The first phase of the conservation of the hull took 17 years. Preserving and reinstalling loose objects took a long time, as did the cataloguing of the finds and building up the knowledge about the ship and her time.

Wasavarvet was built to enable the ship to be conserved, restored and preserved for the future. The visitors were welcome to follow the process, but had to share the conditions that best suited the ship.

2 The Vasa Museum

In 1990 the present Vasa Museum opened to the public. It has almost everything that Wasavarvet lacked. There is a large ship's hall where the Vasa can be seen from every angle and level, although visitors are not allowed onboard the ship. The public areas are dry and comfortable, with a nice restaurant, a large cinema and a museum shop. Exhibitions, both permanent and temporary surround the ship. The Vasa Museum is also very popular, about 800 000 people come to the museum each year, and visitor enquires show that the majority is more than pleased with the experience. As far as the public side of the Vasa Museum is concerned, the management planning has been truly successful.

The planning for the future preservation of the ship and her artefacts was less anticipating. It was thought that the conservation was completed and that maintenance would be enough for the future.

It would be wrong to give the impression that future preservation was not considered when the Vasa Museum was planned. The new museum incorporated systems that would ensure a safe future for the ship, for example a stable climate. The problem was more the absence of a long-term management plan where many aspects were considered and possible problems anticipated.

3 Preservation problems

Since 1990, a number of things have happened which will endanger the future survival of the Vasa.

The climate plant installed in the new museum has proved inadequate, especially during wet summers. The combination of high humidity and large numbers of visitors makes it impossible to maintain an even climate within required specifications. A new climate plant is being designed, but the size and the height of the building, with lots of people during the day and none at night, makes this a difficult task.

In 1999, salt precipitates were discovered both on the hull and on some artefacts. Further investigations showed that the wood contains sulphur, which accumulated in the ship during the long time when Vasa rested in the waters of Stockholm harbour. The sulphur could further weaken the already degraded wood, so it is a very serious problem. A symposium held at the Vasa Museum in January 2000 showed that this problem exists in many wooden ships that have been submerged. A research program to investigate the problem and to suggest solutions was then initiated together with several Swedish universities.

The 5000 mild steel bolts, installed to replace the rusted original bolts, will probably act as catalysts and further increase the sulphur problem. The bolts are vital for ensuring that the shape of the ship is maintained, and also serve as fastenings for all structural elements in the hull. The bolts will have to be substituted where possible, using corrosion free materials. Replacing the bolts can prove to be destructive, since a large number of them are firmly embedded in the hull.

The supporting cradle that is vital for ensuring the stability and shape of the ship will have to be replaced. It is possible that parts of the ship will have to be dismantled in order to make it possible to treat sulphur-affected areas, which are inaccessible today. The present cradle supports the outside of the hull, but in the proposed cradle an internal support is also projected. The present cradle is built of mild steel, and is difficult to maintain in the museum building. A new cradle will have to be constructed of corrosion free materials.

The sulphur-affected areas are treated temporarily with bicarbonates in order to raise the pH-level in the wood. The areas on the outside of the hull are reached with an overhead crane, and with staging. This restricts the view of the ship to a certain extent. Future treatment is likely to be both more intense and frequent,



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which means that the visitors' experience of the ship will be different from today.

4 Public interests versus preservation

During these 10 years, when a number of problems gradually threaten the future of the *Vasa*, the public side of the museum has flourished. The tourists have continued to come, the 10 millionth visitor arrived in the summer of 2002. A number of exhibitions have been produced, and business functions have been developed. It is not unusual to have 500 people dining under the bows of the *Vasa* at night. The education department has been amongst the most innovative in Europe, and marketing and information have been truly professional.

The preservation work did not develop in the same way. The conservation plant was partly dismantled, and one of the main efforts during the middle of the 1990s was reconstructing the ship's lower rigging. This work had in fact little to do with preservation, but was done mainly to present a more complete ship to the public.

It would be wrong to maintain that the management of the museum was solely responsible for the lack of preservation efforts. In order to raise the level of preservation, those working in this field must learn to use the same marketing tools as the more public departments of the museum. Preservation is too often seen as a silent and hidden part of the museum, but should be as public and informative as any exhibition or other public domain.

In the near future, it will be necessary to build a laboratory at the *Vasa* Museum to treat components and artefacts with sulphur damage. As there is no free space in the museum building, it is difficult to find a suitable place for a small conservation plant. In fact, only a few locations are possible, and those are also needed for other functions.

This puts preservation in a complicated situation. It would probably not be too difficult to enforce the best preservation location for a laboratory, but that would make future co-operation with other departments difficult. So, in order to create a favourable climate for preservation management, a compromise will have to be made.

Most of us working with the saving of historic ships think that preservation is the core of the museum's operations. In many ways, this is true, but we should not expect every one else to share our opinions regardless. The *Vasa* Museum today is a specialised institution, where staff is taken on because of special skills. It is unwise to assume that a specialist in marketing will automatically recognise the need for increasing the efforts of replacing rusting bolts in the hull of the *Vasa*. Those of us responsible for restoration management will have to market our plans and ambitions successfully within our own organisations. If we fail in this, it will be even more difficult to convince those outside our institutions.

This does not mean that we should bend the rules, and try to minimise problems, or to be too ready to compromise. We must stand up for our ships, we must maintain a firm policy, but we must also learn to use tools that are not the first ones that come to hand when restoring historic vessels.

5 Management plans

Creating a good management plan is often a formidable task, especially if there is no clear demand for a plan within the museum. Most organisations will perhaps recognise the need of a plan for preserving a historic ship, but fail to see the significance of combining the efforts of managing the ship both as a public asset and an important artefact.

Many plans are produced in order to raise money to preserve the ship. The existence of the National Lottery Fund in the UK has resulted in the production of a number of preservation plans, and several of these have resulted in successful bids. Raising money for preserving ship with the help of the Lottery Fund has become highly competitive, so the plans must be both persuasive and explicit. So, by creating a competitive situation, the National Lottery Fund has contributed to raising the standards of preservation for historic ship. This may seem to be a cynical attitude, but it is also a reminder that it is not enough to have a priceless ship. You do have to be able to prove that you are capable of taking care of her. It is important to realise that to focus on preservation alone will not be enough. Museums or other institutions with historic ships are seen part of the tourist industry, and will have to compete with a growing number of leisure activities for visitors and funding.

6 The time factor

The main problem when applying for funding is time. When the research programme for dealing with the salt precipitates of the Vasa was formed, it soon became apparent that various research funds would have to be approached. Since all foundations have fairly strict guidelines for handling and giving out money, writing applications is time consuming. The first Vasa applications were not immediately successful. Most foundations reacted favourable, but almost all asked for further information or for a different approach. So, after two years of writing and discussing applications, the research programme has not yet been secured financially. Meanwhile, the research has to be maintained, practical tests on the Vasa and her artefacts will have to be carried out, and renewed or altered applications must be written.

The conclusion is that in order to afford to apply for outside funding, the museum has to have a stable financial standing and a good staff situation.

The positive result is that this battle has engaged everyone at the Vasa Museum. For example, the Exhibitions Department very quickly produced an exhibition called "Cure the Vasa" and the Information Department has met the demands of media representatives from all over the world.

7 Preservation as a public asset

Preservation work is often difficult to justify. Preservation is likely to be expressed in terms as “expensive”, “never ending”, “a drain on resources”, “unsightly”, “noisy” and so on.

Most institutions desperately want to get the bulk of the preservation done, in order to be able to start marketing the ship to visitors.

The reason behind this attitude is probably lack of imagination and understanding. There is in fact nothing that indicates that our museum visitors are opposed or hostile to preservation work going on. There are examples that clearly show that these are activities, which interest a large number of people.

A couple of years ago, we built a reconstruction of one of Vasa’s smaller ship boats in the museum. The purpose was mainly to learn more about what the boat could have looked like, and how it handled under sails and oars. The project was in fact quite basic, and did not involve specialised scientific research or study of the artefacts in greater detail.

Because the building of the boat took place just beside the Vasa, and could be closely followed by our visitors, it served as a focus point for preservation. It was natural for the onlookers to ask the Vasa shipwrights questions, not only about the small boat, but also how the Vasa was being preserved. The small boat was very useful in that respect. The Vasa is large and complicated. Many structural elements in the ship cannot be seen from the outside. By using the small boat as an example, the shipwrights were able to explain construction details of the Vasa.

At first, opinions regarding the value of building the small ship boat differed within the museum. Many thought that this was improper use of skilled labour. These assets should surely be used on the Vasa instead.

In fact, they were used for the benefit of the Vasa. To widen the understanding of preservation, restoration and reconstruction is as important as working directly with the ship. Without this understanding and acceptance, it will be difficult to improve preservation conditions.

When the news about the sulphur problems of the Vasa reached the media, journalists and television teams suddenly focused on preservation issues. The conservators especially, found themselves being interviewed frequently. The information department was quick to see the value of this, and marketed preservation intensely.

It is interesting to notice that a situation, which is extremely serious and threatens the future of the Vasa, can also be used to the museum’s advantage. We have to consider this very carefully when planning the future management of the Vasa. We need to learn to use the sulphur problem wisely, and make sure it will help us saving the ship, rather than destroying her.

8 Facing the problems

If this can be achieved, the sulphur problem can at least make it possible to further improve the climate plant at the museum, and to help us design and build a new cradle for the ship.

These preservation efforts are necessary, and should be done regardless of the sulphur in the Vasa. The irony is perhaps that a serious problem should be seen as beneficial to the preservation of the ship, and that experts in chemistry rather than in ship preservation brought the problem to the attention of the media. For the museum, recognising the problem meant admitting shortcomings in the preservation programme. The chemists saw the problem as a challenge, and were perfectly willing to discuss it openly.

Many ships are indeed being preserved on a short-term basis. It is widely accepted that ships have to be kept outdoors, either afloat or ashore. The reason is usually the notion that it must be possible to see the ship from a distance. If the ship is not visible, she will not attract visitors.

It is difficult to preserve a historic ship in the open for a very long time. Rains, wind, sun and pollution will weaken the structure and make maintenance expensive. The result will be that the ship degrades quite rapidly. The only way to counteract this is to spend even more money on maintenance. Sooner or later, maintenance will not be enough, and original parts and structures will have to be replaced with reconstruction or copies. Eventually, it will become too expensive to keep on reconstructing parts of the vessel. The ship could by then have lost so many original features that it will be difficult to maintain that this is still a historic ship. There is sadly enough no shortage of ships around the world, which are in these difficulties.

It is interesting to note that several management plans include the option of placing the vessels under cover. The future plan for *Ss Great Britain* in Bristol includes cover up to the water line. The *HMS Unicorn* in Dundee may end up inside a building and the submarine *U-505* in Chicago will soon be displayed indoors. The owners, the Museum of Science and Industry state that it will be practically impossible to save the ship, unless she is placed inside a climate-controlled building. Of course, smaller ships and boats like the *Skuldelev* ships in Roskilde, Denmark are safely preserved in buildings.

9 The Vasa Management Plan

The management plan for the Vasa does not yet exist as a complete document. This may indeed seem strange, as this paper strongly emphasises the need for complete management plans for preserving historic ships successfully.

Like so many other operators of historic vessels, we are constantly faced with problems that need solving. This makes it difficult to allocate enough time and resources for long-term planning.



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The sudden exposure of salt precipitates on the *Vasa* and her artefacts changed things dramatically. Suddenly, the preservation of the ship was the key issue. This resulted in a demand for plans and remedies to meet the situation.

There are six main issues that are the foundation for the *Vasa*'s future:

1. A new climate plant must be installed in the ship's hall.
2. Objects stored onboard the ship must be relocated to external stores.
3. A research project concerning the salt precipitates must be initialised.
4. Practical test for neutralising salt precipitates must be started.
5. The corroding steel bolts in the *Vasa* must be replaced.
6. The supporting cradle for the ship must be renewed.

These fundamental targets will be supplemented with in dept documentation and research. There are many ways of compiling the resulting material. The most usual procedure is perhaps to produce a written document, composed in a logical manner.

We will choose a different approach for the *Vasa* preservation management plan. We are just in the process of laser scanning the entire ship. The scanning will reproduce *Vasa* as a point-cloud, consisting of many millions of points. Each point will be defined in three dimensions, x, y, and z. When this is accomplished, the *Vasa* will be mathematically saved for the future.

The resulting data are directly related to our local net of co-ordinates, designed a couple of years ago for *Vasa*'s geodetic monitoring system. This system is used to detect movements in the ship's structure, but the co-ordinates also makes it possible to get highly accurate scanner data.

It will then be possible to produce CAD drawings of the entire ship, together with sections, details or ornaments. With the collected data, a 3D model of the ship will be created. The digital model will be the base for future preservation management.

All available digital documentation will be linked to the 3D model, as will the design proposals for a new cradle, the renewal of bolts, the database for salt precipitates and future conservation work.

The 3D model and its linked contents can be used for further purposes. In fact, it will be possible to link any information concerning the *Vasa* to the model. The aim is that anyone with access to the Internet should be able to "surf" the *Vasa*, and follow the future preservation management of this priceless ship.