‘Keeping Things Shipshape’

Conservation Management on HMS *Belfast*

MA Museum Studies

2013

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Abstract

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‘Keeping Things Shipshape’: Conservation Management on HMS Belfast

This study aims to highlight the difficulties of conserving historic ships when they are required to function as an accessible museum as well as officially being an accessioned museum object, and how these difficulties can be successfully managed. By framing the assessment of HMS Belfast’s conservation management plan in the wider debate surrounding large object conservation and the levels of restoration rather than preservation that have been considered acceptable in the past, the key shift in attitude to a more ethical, museum-focused approach can be better appreciated. Through interviews with staff and volunteers directly involved in the conservation process, an idea of how the ship’s Conservation Policy was created and how it can be implemented to ensure the preservation of the ship’s original fabric and key historic significance can be gained. Once the contents of the policy and how they affect conservation planning in theory are understood, the impact of providing access and interpretation to visitors, limited resources and external environmental factors is considered, along with the various techniques employed in managing them utilising policy frameworks to ensure minimum destruction of historical evidence. Through contact with other museum ships, benchmarks to assess success can be established, with favourable comparisons being drawn internationally. Finally, there are suggestions for improvements and opportunities for the future, both for HMS Belfast and other historic vessels.
Acknowledgements

Firstly I would like to show my appreciation to my Dissertation Supervisor, Dieter Hopkin, and the Museum Studies Department at the University of Leicester for all of their advice and guidance during the completion of this project. I would further wish to thank all the staff and volunteers of HMS Belfast for their assistance in providing access to resources, and especially those who gave up their valuable time to participate in interviews without which this project would not have been possible. I would also like to express my gratitude to the staff of Imperial War Museum London, HMS Victory, Fireboat Alexander Grantham in Hong Kong, Battleship Cove in the USA and Kinenkan MIKASA in Japan for their continued assistance and provision of information via email.
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Introduction

As the UK Government’s Department for Culture, Media and Sport (DCMS) attests, “Great Britain owes a great deal to its naval history.”\(^1\) It is perhaps then no surprise that many consider “historic ships [to be] a vital part of the UK’s historic environment”\(^2\) as they represent “seductive artefact[s]” that can “appeal as emblems of memory and identity.”\(^3\) Indeed, the experience offered by visiting an historic vessel is almost unique, offering “the opportunity to not just look at, but to actually walk through an artefact” and to understand the equipment contained within in its natural context.\(^4\) It is this ability to reveal more about the past by gaining a wider sense of social history through interaction with the stories and objects associated with the ship that brings some, such as Divall and Scott, to assert that ships, in fact, can even offer lessons to the more established, traditional transport museum.\(^5\)

In spite of the widespread acknowledgement of the significance of historic ships, they currently occupy an awkward position in the wider heritage landscape in the UK, with “no protective legislation of the kind of enjoyed by historic buildings,”\(^6\) and no specific category defined in any broader international conventions. Whilst there was some attempt to remedy this in the 2008 Draft Heritage Bill by including the designation “vessel, part of a vessel, or the remains of a vessel or part of one” as a “Marine Heritage Asset,”\(^7\) unfortunately the Bill was subsequently dropped, and the Cutty Sark and City of Adelaide remain the only listed ships, neither of which are afloat.\(^8\) As it stands, it has been left to bodies such as National Historic Ships (NHS) in the UK – formed with the aim of providing “leadership and strategic vision across the historic ships communities and wider maritime sectors by acting as a focus on all aspects of the conservation of historic vessels”\(^9\) – to create their own frameworks and

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2 Ibid.
7 Department for Culture Media and Sport (DCMS). *Draft Heritage Protection Bill*. (London: Department for Culture Media and Sport, 2008) p46
9 Ibid. p3
guidelines to address the “plight of maritime heritage and ship preservation” and “legacy of neglect” documented by DCMS.

As a result of these protection issues, historic vessels have often tended to be treated in the manner in which they would have been during active service – often without any coherent conservation policy – leading “methods and aims [to] vary enormously between the many museums and organisations that care for these special ships.” More recently there has been a shift towards trying to utilise museum conservation ethics, especially on those vessels contained in museum collections or considered to be of exceptional historic significance, including HMS Belfast. This attempt to “translate a concept of restoration across from the fine arts to technical artefacts,” however, has merely added another dimension to the complex debate surrounding the appropriate approach towards access, operation, and levels of restoration in large and technical object conservation, including the much more considered fields of locomotive and aircraft conservation. It is only through careful analysis of this professional debate, and how the differing viewpoints on the interpretation of the standards and guidelines within it affect historic ships, that any assessment of the practices and conservation management strategies of a particular vessel can be undertaken.

HMS Belfast represents an ideal example of an historic ship to examine in closer detail with regard to the management of the conflict of interest and ensuing conservation issues that can arise in a uniquely large accessioned object that simultaneously functions as an accessible museum attraction. Conservation practice on board has fairly recently moved from an ad-hoc Naval-style maintenance system left as a legacy of her time spent in the ownership of a charitable trust, to operating under a comprehensive Conservation Policy that more clearly acknowledges her significance and position as part of a museum collection and greater fulfils the purpose of a museum to offer “protection by means of security and conservation.”

Before arriving at her current museum status, the cruiser HMS Belfast had a long and illustrious service career that defines her current significance and the importance of the

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10 DCMS. Maritime Heritage and Historic Ships. p4
13 Bradley, Susan M. ‘Do objects have a finite lifetime?’. In Knell, Simon. ed. Care of Collections. (Abingdon: Routledge, 1994) pp. 51-59 (p53)
material and historical culture contained within her. After her launch in Belfast in March 1938 and commissioning in August 1939, HMS Belfast intercepted the German liner SS Cap Norte in October 1939 before triggering a magnetic mine in November 1939, leading to her almost being scrapped before undergoing an extended refit at Devonport dockyard lasting more than two years. On her return to the Home Fleet in 1942, she became “responsible for providing close-range heavy cover for the Arctic convoys taking supplies to the Soviet Union,” culminating in her involvement in the sinking of the German battle cruiser Scharnhorst in December 1943. After her key involvement in the 1944 D-Day bombardment of ‘Gold’ and ‘Juno’ beaches, she once again underwent another of the major refits that characterises her history, this time in preparation for deployment in the Far East. Although HMS Belfast arrived in the Pacific after the Japanese surrender in 1945, she remained in the Far East, eventually taking up bombardment and patrol duties in the Korean War between 1950 and 1952. After a final extended refit between 1956 and 1959 to prepare her for the atomic age that brought her to her current configuration, she set sail for the Far East once again and completed a number of training exercises, before being paid off and reclassified as an accommodation ship in August 1963. Despite interest in saving her from the Imperial War Museum (IWM) in 1967, no funding was acquired, but by the time HMS Belfast was ‘reduced to disposal’ and earmarked for scrap in 1971, the HMS Belfast Trust had been formed and they took ownership, moving her to her current location in the Pool of London and opening her for permanent exhibition. She was eventually officially accessioned by the IWM as a single, complete object in good condition in 1982 and has continued to operate in a position of international renown with a permanent on board staff including shipwrights and technicians as well as interpretation and exhibitions staff.

Clearly, the most appropriate and effective way to investigate and gain information on the changing attitudes towards the conservation on as complex and evolving a vessel as HMS Belfast is through contact with these on board staff, and in particular those who are directly involved in managing and carrying out the physical conservation work itself. Staff and volunteers were selected for participation in this study based on their individual roles and involvement in the conservation process. As all the professionals involved are adults below

16 IWM. HMS Belfast Guidebook. p15
17 Wingate, ‘HMS Belfast’, p16
18 IWM. HMS Belfast Guidebook. pp.22-23
19 Ibid. p24
20 Wingate, ‘HMS Belfast’. p1
21 Imperial War Museums AdLib Collections Management System
minimum-risk, after being approached by email and given the scope of the study in advance, those willing to take part in face to face interviews were each provided with an ‘information sheet’\textsuperscript{22} to keep explaining the identity, aims and intent of the researcher and the commitment expected, as well as data protection and publication information. Once the participant was satisfied with the information provided, they were issued with a consent form\textsuperscript{23} to sign, providing a choice in the level of anonymity afforded, if desired, as well the option to withdraw from the study at any time. Interviews were then carried out and recorded at times convenient to the participants, agreed in advance. For IWM staff not based on HMS Belfast or from other institutions worldwide, as there was no need for such in depth answers and no possibility of conducting face-to-face interviews, all information was provided via email with relevant permissions for inclusion in this research. To supplement interview evidence, access was provided to HMS Belfast’s onboard drawing, photograph and reference book archives, as well as all relevant policy documentation to allow as broad a field of research as possible to ensure an in-depth analysis could be achieved.

With the discussion of conservation issues on HMS Belfast framed firmly by the wider debate on the ethical conservation of large and industrial objects, detailed discussion on the theoretical development and implementation of conservation policies, as well as the constraints that can affect the practical implementation of these can occur in an informed environment. An assessment can then be made on the level of success achieved in the management of conservation on the historic ship HMS Belfast and how this compares to other vessels and organisations around the world, as well as offering a chance to look to the future of conservation management on HMS Belfast and possibilities for development.

It is clear that the management of conservation on historic ships is a complex and varied issue, depending very much on the individual vessel and those involved in her care. It is, however, unequivocally a very important issue for discussion as “a relatively new field,”\textsuperscript{24} to rid the industry of the notion that large vessels are nothing more than “huge bloody nuisances,”\textsuperscript{25} and promote Commander Paton’s belief that “they are wonderful vehicles for

\textsuperscript{22} See Appendix 1. p45
\textsuperscript{23} See Appendix 1. p46
\textsuperscript{24} Kearon. ‘Conserving Unique and Historic Ships’
education, inclusivity, regeneration,” as well as “memorials to the past” and “very, very important vehicles for the future.”

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26 cited in DCMS. *Maritime Heritage and Historic Ships*. Ev.18
Chapter 1: The Debate on the Conservation of Large Objects

The conservation of museum objects is a delicate and complex task, usually involving highly trained staff acting in “the best interests of the objects” and following detailed advice, such as that of the United Kingdom Institute for Conservation (UKIC) in their ‘Guidelines for Conservation Practice’ issued in the 1980s. Whilst these guidelines that call for “total respect for the physical, historic and aesthetic integrity of the object” may work well for more traditional collection items such as furniture, this does not mean that they necessarily translate to large, technical or industrial objects, defined by Storer as “anything too big to carry,” that also feature heavily in modern museum collections. This can lead to situations in which large object conservation, including that of historic ships, “is not undertaken by the museum’s conservation department, indeed they do not even play a consultative role,” with much of the work instead “the province of retired engineers, mechanics, service personnel and other volunteers.”

This different attitude towards this type of object has led to an almost universal tradition in which “vintage, veteran and historic vehicles have always been restored rather than conserved, mainly to an ‘as new’ operating condition,” with objects treated “no differently from when they were overhauled during their working lives” and with “no attempt to address the basic problem of the destruction of evidence.” It is precisely this dichotomy, between the aim of the museum to preserve material evidence through the conservation of objects and the common practice of restoration rather than preservation when dealing with large and industrial objects, that has sparked such a fierce debate in the museum community in the last few decades. This is despite the fact that industrial objects have formed part of museum collections for more than one hundred years, and that “articles concerning restoration

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28 Ibid.
30 Burningham. ‘Large Watercraft in Museum Collections’.
31 Staehens and Morris. ‘Crossing the Line’. p1184
and preservation of historic vehicles have always appeared in enthusiasts’ and collectors’ publications,” although until recently “there has been very little in the professional museum and conservation journals.”  

Before examining the debate further, it is important to carefully define the terms for the different processes involved. The Museums and Galleries Commission (MGC) defines ‘conservation’ as “all actions aimed at the safeguarding of cultural property for the future,” with its purpose “to study, record, retain and restore the culturally significant qualities of the object with the least possible intervention.” Whilst ‘preservation’ and ‘restoration’ can both be considered part of the conservation process and both can, in some circumstances, be legitimately necessary, they have very different consequences and definitions. ‘Preservation’ is defined as “all actions to retard deterioration of, or to prevent damage to, cultural property,” with the aim to maintain the object “as nearly as possible, in an unchanging state.” On the other hand, the ‘restoration’ that has historically been prevalent in the large, industrial object and historic transport sphere is much more intrusive and defined as “all action taken to modify the existing materials and structure of cultural property to represent a known earlier state.”

Part of the debate lies in what constitutes ‘original’ and therefore what is to be preserved and what level of restoration is appropriate for the purpose of conservation. Obviously in museums, the whole of an object’s life, and the alterations and additions made to it as part of this life, are important to its significance and value as historical evidence. However, using the museum definition of ‘original,’ i.e. “whatever condition [an object] entered the museum collection,” can be very difficult as many industrial objects, and particularly historic vessels, are not acquired immediately and suffer long periods of deterioration between “decommissioning and donation to a museum organisation.” In this situation, the as acquired ‘original’ can, in fact, serve to alienate the very visitors the museum is trying interpret it for, and whilst it may be admirable or, indeed encouraged in some organisations,

35 Newey and Meehan. ‘New approaches in the preservation of vehicles’. p11
37 Ibid.
38 Ibid.
to display the ‘reality’ of machinery at the end of its working life,\textsuperscript{41} in aircraft collections, for example, it is considered that an object ‘that truly shows neglect and decay will [not] convey the importance for which it is in the museum,’\textsuperscript{42} leading to an argument for a restoration rather than preservation approach. On top of this, during their working lives most industrial objects, and indeed ships, are considered fairly ordinary, common, and designed to serve a specific purpose,\textsuperscript{43} often containing perishable components “which suffer from considerable wear, having a short working lifetime”\textsuperscript{44} and are therefore continuously replaced. This can serve to excuse or encourage continued restoration, maintenance and even replacement, even though in theory, once an object is part of a museum collection traditional maintenance is not always appropriate and it is certainly not the case that “preservation of the ongoing repair process constitutes preservation of the [object] itself.”\textsuperscript{45} Many, such as Tanner, have expressed their concern over methods that favour replacing parts, as it may eventually lead to none of the original constituent parts remaining, leaving an object that merely occupies the same space as the original.\textsuperscript{46} This highlights how far the debate has moved from Christensen’s attitude towards boats in museums in the 1970s that states that “the value…rests in the object as a symbol, even when the vessel has undergone so much repair and restoration as to have little or no original material left.”\textsuperscript{47}

Another key aspect of the conservation debate is the issue of ‘working’ machinery, whether for demonstration purposes or, in the case of historic vehicles, for operation and use. Whilst there are certainly those who would never recommend the operation of historic machinery due to the risk of destroying the original fabric of the object, at the other extreme there are those who claim that mechanical objects cannot fully be understood in static condition, and that “the primary objective of a technical museum is the exploitation of the artefact for the public benefit rather than the simple preservation of material evidence.”\textsuperscript{48} There is no doubt that any operation of an historic artefact will eventually cause “significant cumulative degradation”\textsuperscript{49} in the moving parts, and therefore perhaps does not conform to the strict definition of


\textsuperscript{42} Mikesh, Robert. Restoring Museum Aircraft. (Shrewsbury: Airlife, 1997) p11

\textsuperscript{43} Kearon. ‘Conserving Unique and Historic Ships’

\textsuperscript{44} Bradley. ‘Do objects have a finite lifetime?’ p52

\textsuperscript{45} Tanner. ‘Ship and Boat Preservation’. pp.4-5

\textsuperscript{46} Ibid. p5

\textsuperscript{47} Christensen, Arne Emil Jr. ‘Some thoughts on boats as museum objects’. The International Journal of Nautical Archaeology and Underwater Exploration. 2 (2) (1973) 345-254 (p345)

\textsuperscript{48} Mann. ‘Working Exhibits and the Destruction of Evidence in the Science Museum’. p383

\textsuperscript{49} Hopkin. ‘A commentary on restoration, conservation and the National Railway Museum collection’. p220
preservation, but most professionals are currently of the thinking that “in order to maintain mechanical objects like cars that have moving parts a degree of mobility must be preserved so that parts do not lock or corrode together causing more irreversible damage.” At the very least machinery requires lubrication, which can avoid the seizing of equipment as well as providing a protective coating for parts that are not easily accessible any other way to ensure they remain preserved in a stable condition.

The issue of appropriate storage conditions, given the extreme size of aircraft, ships and agricultural machinery, is also the cause of discussion, as again large industrial objects fail to conform to expected museum standards. Indeed, the best place for a museum object is inside a museum building, as metals in particular, which make up a high proportion of large and industrial objects, are best stabilised and corrosion reduced by “controlling environmental conditions” by reducing relative humidity and moisture in the air as well as regulating temperature. Where possible, most consider that an important aim should be to get large objects into a stable environment, even if they have spent their whole functional life outdoors. With aircraft, and ships in particular, however, this is very rarely possible due to the sheer scale of the resources and building size that would be required to house them. This leaves them in a vulnerable state as museum objects as they are left in a position that causes them to be “subject to degradation that will inevitably reduce their long term structural stability,” as “even the most heavily built or well maintained artefacts cannot last forever outside.” This undesirable situation can force those responsible for such large museum objects to once again opt for a continuous programme of restoration, and in some cases even go as far as only planning to keep the whole object for a finite period of time before selecting individual components for display indoors in a bid to save at least some of the historic fabric.

Clearly the conservation of large and industrial objects is a minefield of ethical issues, but despite Gottwaldt asserting that “there is no one answer” as far as best practice goes, in 1994 the MGC published a specific set of ‘Standards in the Museum Care of Larger and

50 Newey and Meehan. ‘New approaches in the preservation of vehicles’. p12
52 Bradley. ‘Do objects have a finite lifetime?’ pp.54-55
54 Divall and Scott. Making Histories in Transport Museums. p56
55 Mikesch. Restoring Museum Aircraft. p174
56 Gottwaldt. ‘A philosophy of display’. p213
Working Objects’ to go some way to address the fact that “there is comparatively little in print on the care of larger objects.”\textsuperscript{57} These guidelines, whilst recommending that the aim for industrial objects should be to maintain the historical integrity and physical condition as far as is possible whilst not allowing the object to deteriorate avoidably\textsuperscript{58}, are fairly vague and very general. Although they do contain useful advice for certain types of objects, there are still flaws when attempting to apply them to, for example, historic ships, as they seem in the interpretation to mainly focus on smaller ‘large’ objects that are still possible to move indoors or secure and cover if stored outside.\textsuperscript{59} Whilst the Canadian Conservation Institute (CCI) also provides slightly more in-depth guidelines on specific topics that can be particularly problematic including the ‘Care of Machinery Artefacts Displayed or Stored Outside’\textsuperscript{60} and ‘Outdoor Storage and Display: Remedial Measures,’\textsuperscript{61} these still do not provide the kind of advice necessary to effectively conserve an object as large as a ship or sometimes even a locomotive.

Indeed, there has been most progress in the development of an industry-specific set of guidelines in railway museums, with the first attempt at a framework, however flawed, developed in 1948.\textsuperscript{62} More recently there have been moves towards a much more ethical approach to conservation more closely reconciled with that of other more traditional museum objects, taking historical significance and original fabric much more into account than in some of the earlier practices put forward in the large object conservation debate. Rees describes that “if instead of applying the philosophy of museum conservation to locomotives, we apply the conservation philosophy of historic buildings, we suddenly find ourselves amongst familiar problems, dilemmas and solutions.”\textsuperscript{63} He goes on to suggest that the principles contained within the Australian ‘Burra Charter’ of 1999 that call for a place to “retain its cultural significance,” “can be applied to machines just as they can to buildings, and do not conflict with, though they perhaps imply a modification of, established museum practice”\textsuperscript{64} and represent a good starting point for the development of object-specific policies. In 2008 English Heritage published a similar set of ‘Conservation Principles’ for historic places that can similarly be transposed to machinery through its careful consideration of the

\textsuperscript{57} MGC. 4. Standards in the Museum Care of Larger & Working Objects 1994. p6
\textsuperscript{58} Ibid. p20
\textsuperscript{59} Ibid. pp.71-72
\textsuperscript{60} Canadian Conservation Institute (CCI). Canadian Conservation Institute Notes 15/2: Care of Machinery Artifacts Displayed or Stored Outside. (Ottawa: Communications Canada, 1993)
\textsuperscript{61} Prytulak, George. Canadian Conservation Institute Notes 15/9:Outdoor Storage and Display: Remedial Measures. (Ottawa: Minister of Public Works and Government Services, 2010)
\textsuperscript{62} Hopkin. ‘A commentary on restoration, conservation and the National Railway Museum collection’ p217
\textsuperscript{63} Rees, Jim. et al. ‘The Conservation of Operational Steam Locomotives’. Industrial Archaeology Review. 32 (2) (2010) 91-102 (p93)
\textsuperscript{64} Ibid.
assessment of heritage values “for present and future generations” and the acknowledgement that at times, intervention and repair may be necessary as well as merely preservation.65

Similarly to locomotives, parallels can easily be drawn between historic buildings and historic ships that can be useful in deciding how to conserve them. Indeed, “ships and houses are the only museum objects which permit the spectator to literally walk in the past.”66 It is this level of access, unlike almost any other museum object, that makes individual publications designed for buildings as well as over-arching policy documents particularly useful, especially in the case of accessibility, where there are detailed guidelines on appropriate and non-intrusive adaptations which can be utilised in order to improve inclusivity or conform to legislation.67 At the same time however, “historic ships seem to be in a world all their own, distinct from other museums and historic sites,”68 occupying an awkward and unique position which often does not ascribe them the same level of respect as other museum objects. Indeed, whilst discussing transport heritage in 1975, Allen outlined that all an historic ship would need to be kept in good condition was “a watch and cleaning gang if the ship is immobile.”69 This kind of attitude and lack of understanding of and planning for the huge task and resources involved in conserving historic ships has, unfortunately, led to many projects failing altogether and ships being lost due to a loss of money and enthusiasm.70

Even though policies designed for both different types of objects and historic buildings can be useful as a starting point for the conservation of historic ships, they do not adequately address all of the particular difficulties associated with objects that are so large, often fragile and sometimes afloat and needing adaptation. However, it has often been noted that “there are no textbooks or reference manuals specifically dedicated to [ship] museum operation, as there are for terrestrial historic sites or structures.”71 In 1990, “to answer a longstanding need for uniform standards that may be applied to preservation projects involving historic vessels,”72 the US Secretary of the Interior published a detailed set of standards and guidelines that


66 Christensen. ‘Some thoughts on boats as museum objects’. p345


68 Sendzikas, Aldona. ‘The Role of the Curator in Historic Ship Preservation’


70 Tanner. ‘Ship and Boat Preservation’. p1

71 Lamm. Floating Fortress, Floating City, Floating Monument. p3

recognise “the unique problems of historic preservation in a maritime context.” These represent the first set of industry-specific standards, but they remain voluntary and were published long after many historic ships, including HMS Belfast, had begun their conservation work, with many shipkeepers preferring to “exchange ideas, deal with problems, and provide support for each other” in forums such as the Historic Naval Ships Association (HNSA), formed in 1966. The comparable network in the UK, NHS, as well as acting as a forum for advice, has also published its own similar set of “standards to aspire to and parameters within which to work,” in a much simpler, user-friendly form so as to not alienate non-museum shipkeepers, but this was not until 2010, and many historic ships still operate a “crossing a river by feeling the stones” approach to conservation.

From the complex and many-branched debate on large and industrial object conservation, as well as the industry-specific problems facing historic ships, it is clear that “there is a need to come to terms with some of the inconsistencies in our predecessors’ policies and clarify our own approaches.” The best way to achieve this is through conservation management planning, in order to gain objectivity as well as clarity on the different kinds of conservation work involved, and deal “with the coherent and justifiable management of change.”

Coherent conservation planning advice has been developed by the Heritage Lottery Fund in their publication ‘Conservation Plans for Historic Places,’ and although not designed for historic ships, “for the purposes of the methodology of the plan, the only difference is purely one of language.” Conservation plans begin by acknowledging that all plans and heritage assets are entirely unique by defining the significance of the asset or object, in the case of historic ships extensive advice on which may be found in the NHS publication ‘Recording...”

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77 Tse, Jonathan C.Y., Assistant Curator I (Conservation), Fireboat Alexander Grantham, Hong Kong Museum of History, personal communication, 04/07/13
78 Hopkin. ‘A commentary on restoration, conservation and the National Railway Museum collection’. p220
79 Tanner. ‘Ship and Boat Preservation’. p2
82 Tanner. ‘Note on Conservation Planning for Ships’. p4
Historic Vessels’s and may include, amongst other criteria, the vessel’s uniqueness “in terms of type and function,” its “contribution to a broad understanding of maritime history,” or its “contribution to technology.” A good conservation plan will then “explain how that significance is vulnerable” and “what policies you will adopt for retaining the significance,” with a key aspect being comprehensive documentation and an understanding of how all work and maintenance relates to the conservation plan. As they are generally considered somewhere in between an object and a building and many protections afforded to both categories do not necessarily apply to them, conservation plans can be especially important for historic ships to ensure their continued preservation for generations to come.

In order to explore how historic ship conservation management plans are developed and function in the real world to identify and manage the conservation issues that can arise, it is important to examine an example of a vessel that has applied this approach successfully to combat the fact that “the care of boats, particularly of those afloat, can be more difficult than the care of any other large object,” namely HMS Belfast.

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84 Ibid. p12
85 HLF. Conservation Plans for Historic Places. p5
Chapter 2: Conservation on HMS Belfast – In Theory

HMS Belfast was ‘saved for the nation’ and has been operating as a museum since 1971, with it officially becoming a museum ‘object’ in 1982. Whilst she now operates under a fairly comprehensive ‘Conservation Policy’ this is a recent development in the ship’s history, with the first incarnation of the policy written in 2006 and the latest version completed in 2012. Previously “it was broadly run along the lines of a naval ship,” with “no maintenance system in place,” meaning that common practice was to “repair as things broke” to just keep “the visitor route open and safe” and “most of the upper deck fittings, for instance, had just been ignored.” Indeed, Simon Brooks, the ship’s Electrical Officer for the past 32 years, recalls that in the past sometimes things weren’t conserved at all and the funnels, for example, “were just made over…to make it look authentic, but not necessarily conservation,” and even worse, “bits of the ship cut away and just lobbed in the skip.” These practices were, however, merely a continuation of the way she was run under the HMS Belfast Trust between 1971 and 1978, who had the sole aim to “stop it going to the scrapyard,” but had no formal plans and a desperate need to find a way of “making it pay.” This involved “strip[ing] out several compartments to create quite large spaces for…holding functions,” but has the consequence that “all the original fixtures and fittings just disappeared” and nothing was recorded.

Clearly these processes do not represent best practice, and in fact have resulted in the destruction of historical evidence and the original fabric of the ship with no attempt to preserve the ship in its physical form rather than merely as a symbol. Fortunately, this has begun to change under the guidance of current Conservation and Facilities Manager, Andy Curran, who has attempted to change traditional attitudes and encourage a more considered and recognised ethical approach through conservation management planning. HMS Belfast’s Conservation Policy came about as a reaction to the obvious need to improve maintenance practices “to get ahead of all the breakdowns so that things were maintained in…reasonable time to prevent breakdown” and to attempt to “keep the various bits of the ship that weren’t safety dependent maintained the same as the rest of the ship” to “make sure that we could

88 Curran, Andy, Conservation and Facilities Manager, HMS Belfast, interview with author, digital recording, 18/07/2013, London. See Appendix 3. p69
89 Ibid.
90 Brooks, Simon, Electrical Officer, HMS Belfast, interview with author, digital recording, 18/07/2013, London
91 Ibid.
92 Curran, Andy, interview with author, 18/07/2013
93 Brooks, Simon, interview with author, 18/07/2013
preserve them for the future." The policy was developed in-house by the Conservation and Facilities Manager, although other organisations with similar policies, such as ss Great Britain, have used external consultants to minimise the impact on staff time. The background information to create the policy was taken from the “experience of marine engineers, shipwrights, and other professional on the staff,” as well as “looking at various other museums and how they handled objects, and also how the Historic Naval Fleet managed their work,” on top of numerous other sources, including HNSA and NHS, to create a comprehensive framework within which to work on long-term planning as well as day-to-day maintenance, and even though the IWM’s central ‘Care and Conservation’ team have no involvement in the conservation of the ship, they agree that the policy represents “a conservation standard that is in keeping with ‘other objects in the collection.’”

As with any successful conservation plan, HMS Belfast’s policy begins with an outline of her service history and involvement in key conflicts to create an understanding of her historical significance as “the last remaining big-gun armoured warship from the Second World War in Europe,” and “the first warship since HMS Victory to be preserved for the nation,” although significance statements are also currently being drafted for vessels in the National Historic Fleet, such as HMS Belfast, by NHS. The service history and technical specifications included also demonstrate an acknowledgement of the historical changes and additions that have been made to the ship that now make up her character and original fabric to avoid any temptation to return the vessel to an as-built condition, with areas that “had been stripped out or machinery had been put in, for instance, modern electrical systems, sewage systems” considered to have less of a heritage value due their lack of original material.

The policy also moves on to acknowledge key problems that affect the condition of the ship and may impact on its preservation in the future. These include conservation issues affecting any metal object and particularly “a structure primarily made of steel,” namely corrosion, as well as those unique to the ship and caused by poor practice in the past, such as the lack of records of treatments carried out and the removal of fittings, as well as damage caused by

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94 Curran, Andy, interview with author, 18/07/2013
95 Curran, Andy, interview with author, 18/07/2013
96 Curran, Andy, interview with author, 18/07/2013
97 Holbrook, Andy, Section Head: Care and Conservation, Imperial War Museums, personal communication, 12/08/2013
98 Curran. HMS Belfast Conservation Policy 2012, p1
100 Cunliffe. ‘Conserving Historic Vessels. RINA Conference – Historic Ships – December 2012’. p1
101 Curran, Andy, interview with author, 18/07/2013
102 Curran. HMS Belfast Conservation Policy 2012, p6
“cocooning and fibreglass.” There is then an outline of the main ‘conservation objectives’ to work towards when attempting to overcome these problems, including the aims “to present HMS *Belfast* in her best possible state, in order to give an understanding of the operation, character and habitability of a cruiser built in the first half of the twentieth century,” and “to preserve the structural and historic fabric of the ship and her fittings, generally based on her 1959 configuration.” As 1959 was the year of the final “modernisation refit [that] actually changed the form of the ship,” it has been decided to “present the physical ship as it would have looked…from 1959-64, but still keeping its history from 1938” to avoid destruction of historic material to restore the ship to its Second World War appearance, even though many may consider this period to be more significant.

With a solid focus and clear understanding of the major challenges facing HMS *Belfast*, a set of clearly defined principles, guidelines and standards for best practice outlining how the objectives can be achieved complete the carefully considered approach to conservation contained within the ship’s policy. These include a specific set of definitions of conservation terms to ensure everyone working with the policy understands exactly what it entails, such as defining ‘preservation’ as “the process of maintaining the original condition of the object” with “minimum intervention…to ensure that the life of the object is maintained for as long as reasonably practicable,” with specific reference to the treatment of corrosion and the 1959 configuration that are unique to HMS *Belfast*. The policy is extensive and covers all of the major issues affecting large and industrial objects, as well as touching on access issues from the sphere of historic buildings. There is advice on if and when replacements can be considered appropriate and how these should be manufactured and installed without conjecture following documentary evidence; the importance of reversibility in carrying out restoration work; documentation standards and an explanation of how all conservation and maintenance works are interlinked through various databases and electronic maintenance management systems and reference to approved, appropriate metal preparation techniques. Above all, the Conservation Policy is a starting point from which to plan all future maintenance and conservation work on board, listing available staff, information and

103 Curran. *HMS Belfast Conservation Policy 2012*, p6
104 Ibid.
105 Curran, Andy, interview with author, 18/07/2013
106 Curran. *HMS Belfast Conservation Policy 2012*, pp.6-7
107 Ibid. p7
108 Ibid. p7
109 Ibid. p10
110 Ibid. p8
111 Ibid. p8
resources and how these can be utilised,\textsuperscript{112} and outlining how best to plan and execute successful future projects to a well defined standard.\textsuperscript{113}

The process involved in carrying out any new, individual conservation project on HMS \textit{Belfast} begins with consideration of how the project fits into the ship’s broader “25-year plan, which is coming together,” and the priorities outlined in the current 5-year plan in place for the upper deck fittings.\textsuperscript{114} Condition is also assessed, with staff and volunteers “carry[ing] out surveys involving damage detection throughout the ship on a regular basis”\textsuperscript{115} to record information on all of the “400 and something compartments, plus all the…guns and so on,”\textsuperscript{116} which are all “treated as their own…entity,” in a simple database from which reports can be produced\textsuperscript{117} to “ensure the overall safety and stability of the structure.”\textsuperscript{118} From this information the Conservation and Facilities Manager sets the objectives and parameters of the project, and then further, more detailed surveys are carried out,\textsuperscript{119} “recording the condition of things under a number of headings, noting any damage, missing items…and trying to identify tasks that need doing”\textsuperscript{120} by breaking the individual asset down to component level and “back[ing] that up with lots of photographs.”\textsuperscript{121} Before starting any conservation work, however, the policy calls for a thorough examination of existing documentation, which due to the fairly recent introduction of the practice of recording “any work that we’ve done, anything that we’ve found, things that we’ve had to change because we haven’t been able to source them,”\textsuperscript{122} is largely historical. For structural work, this includes a comprehensive Ship’s Drawings Archive, through which the changes made to different areas of the ship can be tracked from as-fitted blueprints from her commissioning in 1939\textsuperscript{123} to modernisation refit drawings from 1959,\textsuperscript{124} complete with alteration and additions notes signing off the work in the Ship’s Reference Book Archive.\textsuperscript{125} For the configuration of compartments and the fittings

\begin{itemize}
  \item \textsuperscript{112} Curran. \textit{HMS Belfast Conservation Policy 2012}. pp.8-9
  \item \textsuperscript{113} Ibid. pp.10-11
  \item \textsuperscript{114} Curran, Andy, interview with author, 18/07/2013
  \item \textsuperscript{115} Ibid.
  \item \textsuperscript{116} Hall, Richard, Lead Conservation Volunteer, HMS \textit{Belfast}, interview with author, digital recording, 19/07/2013, London
  \item \textsuperscript{117} See Figure 1, p21. HMS \textit{Belfast} Asset Survey Database
  \item \textsuperscript{118} Tse. ‘An integrated structural health monitoring system for the preservation of the historic fireboat \textit{Alexander Grantham’}. p290
  \item \textsuperscript{119} See Curran. \textit{HMS Belfast Conservation Policy 2012}. pp.15-16
  \item \textsuperscript{120} Hall, Richard, interview with author, 19/07/2013
  \item \textsuperscript{121} Curran, Andy, interview with author, 18/07/2013
  \item \textsuperscript{122} Ibid.
  \item \textsuperscript{123} See Figure 2, p22. HMS \textit{Belfast} Ship’s Drawings Archive, General Arrangements, 79, AM036 (section of), 1/1/39, Technician’s Library, HMS \textit{Belfast}, London
  \item \textsuperscript{124} See Figure 3, p22. HMS \textit{Belfast} Ship’s Drawings Archive, General Arrangements, 2747, AM006 (section of), 1/1/39, Technician’s Library, HMS \textit{Belfast}, London
  \item \textsuperscript{125} See Figure 4, p23. HMS \textit{Belfast} Ship’s Reference Books Archive, \textit{Modernisation Alteration & Additions Book I}, p24, Section Base 3, HMS \textit{Belfast}, London
\end{itemize}
within them this documentation takes the form of a series of photographs from 1959 that cover most areas of the ship, for example the Ward Room.\textsuperscript{126} Lastly, for upper deck fittings and machinery, including gun mounts such as the Bofors Mk.V., there are a number of original maintenance manuals, complete with images, published by the Admiralty.\textsuperscript{127}

Having carefully consulted all available documentation, it is important to “note any specific things like risks – risks to the item, volunteers, and obviously to visitors”\textsuperscript{128} – before starting preservation and restoration work where appropriate. No conservation work on board should be ‘cosmetic,’ particularly as “you can’t keep painting a surface,”\textsuperscript{129} both because “much of the detail in the fixtures and fittings of the ship has been hidden by the liberal application of many coats of paint over the years,”\textsuperscript{130} and because any steelwork “might not look like it’s rusty underneath, but when you take that paint off you will find little spots, and [those] little spots become bigger and bigger.”\textsuperscript{131} As outlined in the policy, the aim is “where possible, to always reuse the original parts,” and where this is not possible, “if we can find an identical component from somewhere then we will fit that.” New parts are only used if the originals “are so badly corroded that we can’t use them,”\textsuperscript{132} with any necessary replica parts being “stamped with an ‘R’ for replica”\textsuperscript{133} so as not to be confused with the historic fabric of the ship, and made, where possible using “the exact same materials as what is there,”\textsuperscript{134} even paint, which is sourced using “the Admiralty paint advisors who give us the British Standard codes for the colourings and they advise us on the best type of paints to use and where to get them.”\textsuperscript{135} The aim for all conservation work beyond preservation of the existing state is reversibility as far as is possible, as “we would like to be able to put it back together if the need ever arose.”\textsuperscript{136} This of course relies on the “fundamental” documentation of “what we’ve

\textsuperscript{126} See Figure 5, p24. HMS Belfast Ship’s 1959 Photograph Archive, Image 218, Director’s Cabin, HMS Belfast, London
\textsuperscript{127} See Figure 6, p24. Naval Ordnance Department. B.R.1919 Handbook for 40mm Bofors Twin R.P. 50 Mark 5 Mounting. (London: Admiralty, 1950) plate 2
\textsuperscript{128} Hall, Richard, interview with author, 19/07/2013
\textsuperscript{129} Martin, Neville, Maintenance Technician, HMS Belfast, interview with author, digital recording, 30/07/2013, London
\textsuperscript{130} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{131} Martin, Neville, interview with author, 30/07/2013
\textsuperscript{132} Hall, Richard, interview with author, 19/07/2013
\textsuperscript{133} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{134} Martin, Neville, interview with author, 30/07/2013
\textsuperscript{135} Elliott, Mark, Shipwright Officer, HMS Belfast, interview with author, digital recording, 18/07/2013, London
\textsuperscript{136} Curran, Andy, interview with author, 18/07/2013
done, how we’ve done it,” culminating in a new set of photographs that show the ‘restored’ condition for comparison with the initial survey photographs.

Once a conservation project has been completed, if there are similar assets, for example gun mounts of which there are multiple of the same mark, a detailed document is created “that gave every step that we took from the initial work…through taking it to pieces, what we did to put it in good condition, and how we put it all back together again” so that “we don’t lose the experience” and the people involved in the next project “won’t have to relearn everything and they won’t make the same mistakes.” Similarly, “what needs to be done to keep the conserved item in good condition,” such as lubrication and regular checks, is documented in a maintenance guide “because…as soon as you stop work on it, it’s going to start to deteriorate and the more regularly you can…inspect and take care of any deterioration, then the longer it’ll be before it needs any serious conservation work again.” The conserved asset is then added to the electronic maintenance system, from which regular job sheets are produced and ordered according to priority to be carried out by staff and volunteers. This also involves regularly moving machinery to avoid it seizing, but “using the emergency back-up, which is hand power,” rather than aggressive powered motion. This is all carried out in an understanding of the fact that “after a vessel’s condition has been stabilised and her basic integrity has been assured, a systematic programme of preventative maintenance must be instituted in order to protect and preserve” the vessel in an “unending process.”

There is a great deal involved in completing a conservation project to manage specific vulnerabilities identified by the Conservation Policy on HMS Belfast, aside from the practical work there are documentation and material considerations that are just as important to take into account, and the process can be painstaking and lengthy. The policy represents a long-awaited move to bring practice on board in line with the recommendations of national and international professional bodies in the field and addresses delicate conservation issues with a focus drawn from both the naval and museum spheres. The process for completing a project

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137 Hall, Richard, interview with author, 19/07/2013
138 See Figures 7 and 8, p25. Photographs courtesy of Andy Curran
140 Hall, Richard, interview with author, 19/07/2013
142 Hall, Richard, interview with author, 19/07/2013
143 See Figure 9, p26. HMS Belfast Frontline Maintenance System
144 Curran, Andy, interview with author, 18/07/2013
145 Sprague, Scott. ‘Operational Machinery on Static Ships’
outlined, however, describes how conservation management would be tackled in theory, in an ideal world, without taking into account many of the constraints and issues that come with the ship operating as a museum as well as on object to be conserved. In practice, conservation work on historic ships is rarely straightforward and there are many other issues that can hinder processes or force methods to change that have to be managed under the umbrella of the Conservation Policy.
**Figure 1:** Example report of asset survey results. (HMS *Belfast* Asset Survey Database)

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**HMS Belfast**

Asset Survey 31/07/2013

Priority 1
Figure 2: Section of as-fitted blueprint showing the forward superstructure of HMS Belfast. (HMS Belfast Ship’s Drawings Archive, General Arrangements, 79, AM036 (section of), 1/1/39, Technician’s Library, HMS Belfast, London)

Figure 3: Section of modernisation refit drawing showing alterations to the same part of the forward superstructure. (HMS Belfast Ship’s Drawings Archive, General Arrangements, 2747, AM006 (section of), 1/1/39, Technician’s Library, HMS Belfast, London)
Figure 4: Page from HMS Belfast’s Modernisation Alterations & Additions Book I with handwritten noted detailing work carried out on the forward superstructure in 1959. (HMS Belfast Ship’s Reference Books Archive, Modernisation Alteration & Additions Book I, p24, Section Base 3, HMS Belfast, London)
Figure 5: 1959 photograph showing HMS Belfast’s Ward Room with original configuration and furnishings. (See Figure 5. HMS Belfast Ship’s 1959 Photograph Archive, Image 218, Director’s Cabin, HMS Belfast, London)

Figure 6: Annotated photographic plate of a Bofors Mk. V. mounting from an Admiralty manual. (Naval Ordnance Department. B.R.1919 Handbook for 40mm Bofors Twin R.P. 50 Mark 5 Mounting. (London: Admiralty, 1950) plate 2)
Figure 7: One of HMS Belfast’s Bofors Mk. V. mountings before conservation. (Photograph courtesy of Andy Curran)

Figure 8: The same Bofors Mk. V. mounting after conservation. (Photograph courtesy of Andy Curran)
Figure 9: An example of a monthly maintenance job sheet for one of HMS Belfast’s 6-inch gun turrets. (HMS Belfast Frontline Maintenance System)
Chapter 3: Conservation on HMS Belfast – In Practice

Whilst all maintenance and conservation work on board HMS Belfast takes place with due reference to and within the framework of the Conservation Policy, there are aspects of its function as a popular museum that can affect planning and decision-making when it comes to new projects and existing maintenance routines. These visitor-related issues have long been identified, and for the most part they are controlled and managed without impacting too heavily on conservation objectives and ethical best practice. Nevertheless, there are undoubtedly actions taken which take visitors into account that may not necessarily have been carried out without the need to manage their safety and expectations, and working practices have had to be adapted to avoid disrupting visitor enjoyment, perhaps having an impact on efficiency. This is not to say, however, that visitors are the only factor that deviations from an ideal conservation project plan can be attributed to. Museum management also plays a role, with staffing levels and resources as well as funding for projects controlled centrally, this can limit the scope of work that is possible, regardless of planning. On top of this, as an extremely large object not only stored outside but also afloat, external influences, in particular the weather, can increase the risk of conservation issues arising as well as limiting when work can be carried out.

HMS Belfast is first and foremost a warship, but she now functions as a museum with “visitors rang[ing] in age from toddlers to quite elderly people, who might not be as agile as young sailors,” who the ship was designed to be manned by and “who could move heavy equipment about [and] access places through vertical ladders and quite small openings.”¹⁴⁶ This has forced some adaptations to the original fabric of the ship, which under the conservation policy would normally be avoided, to allow access for visitors to “explore, experience, and learn about it, so it has a lasting legacy beyond being just an object.”¹⁴⁷ These changes also serve to reduce the risk of accidents to visitors unused to manoeuvring around an historic vessel, although “we haven’t cut much of the ship away to create access.”¹⁴⁸ These adaptations have involved “replac[ing] some of the vertical ladders with normal steps with as shallow a rake on them as we can get” and removing high coamings, as well as “creat[ing] a wheelchair accessible route through a fairly large part of the ship,”¹⁴⁹ including lifts. Where pieces have had to be removed, however, “we’ve kept the pieces that we’ve removed and recorded them, along with photographs – what we’ve done, how we’ve taken it out – and

¹⁴⁶ Curran, Andy, interview with author, 18/07/2013
¹⁴⁷ Scott, Elizabeth, Exhibitions Manager, Imperial War Museums, personal communication, 16/08/2013
¹⁴⁸ Curran, Andy, interview with author, 18/07/2013
¹⁴⁹ Ibid.
we’ve bolted up the actual piece we took out very close to where it came from so that it…could be put back.”

This conscious effort to ensure reversibility where possible for these unavoidable alterations goes a long way to control the impact these access adaptations have on the historic fabric of the ship, emphasised by the fact that “where there have been alterations to the fabric of the ship these are made clear to visitors” and similarly to the Danish steam figate Jylland, lifts and other necessary modern equipment are “installed so that anybody would be able to recognise them as new installations in relation to the ship’s original appearance.” It is “by being honest about what alterations have been made” that the staff believe “the integrity of the ship is maintained.”

Aside from access requirements, there are a number of other health and safety issues that must be addressed in order to allow the visiting public, and indeed staff, to be on board. These include providing modern toilet facilities, as well as the more serious electrical and asbestos regulations and legislation that must be adhered to. Wiring regulations and the ship’s electricity supply have changed meaning that less of the ship’s original wiring can be utilised, as well as the need for PAT testing for newer appliances that can have an effect on conservation planning due to the need for access. “A whole new system of emergency lighting around the ship” has also had to be fitted, which “wasn’t even an issue” in the 1980s, but nonetheless involves attaching new equipment to historic fittings and running in new wires, and this, unfortunately, cannot always be reversible. Asbestos removal is another non-reversible but necessary aspect of conservation work on board HMS Belfast, with the ship housing tonnes of the dangerous substance as an integral part of its original fabric. However, as “even if you could [afford to] get rid of it all, the ship…wouldn’t look like the original ship if you did,” to preserve as much as possible of the ship’s lagging, “it’s all been encapsulated, so it’s nice and sealed” and “as long as it is encapsulated, then…it’s not dangerous.” In high-risk areas such as in “sleepover where kids go down there to sleep,” however, the ship’s staff have had to make the difficult decision to “get the area stripped of asbestos” and then “[get] it relagged with a fibreglass lagging.” This replacement using a different and modern material would not normally be approved under the conservation policy, but legal requirements have made it necessary, with all remaining asbestos surveyed regularly

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150 Curran, Andy, interview with author, 18/07/2013
151 Scott, Elizabeth, pers. comm., 16/08/2013
153 Scott, Elizabeth, pers. comm., 16/08/2013
154 Brooks, Simon, interview with author, 18/07/2013
155 Ibid.
156 Elliott, Mark, interview with author, 18/07/2013
157 Ibid.
and “put on the register which is kept on a web-based site.” In the event of any damage or poor air monitoring results, “we literally have to close the compartment until we can get professional contractors in to sort it out for us,” and this can mean an area “could be shut for more than seven days” while the Health and Safety Executive make sure the work is approved as remedial work can no longer be carried out by on-site staff due to the fact that “now you need to actually have a licence to do that.”

The presence of visitors has a broader impact beyond the realm of health and safety. There is a strong focus on visitor-facing areas and “the visitor route…is what we concentrate on” when it comes to conservation projects. This means that the areas off the visitor route on the lower decks “[haven’t] been touched probably since it was last in commission in the 1960s…and possibly not for a few years before then,” with the aim to be “to just keep them safe and as rust free as possible,” to ensure they are not “deteriorating because they’re tucked away and not visited very often.” Whilst there are “compartments where we’ve had to do remedial works where corrosion has become so bad that it’s likely to escalate into a huge problem,” Lead Conservation Volunteer, Richard Hall believes that “with the areas that the public visit, then it’s obviously much more important that it looks…as it should do for a warship and is kept in good order and ‘tiddly’ as the Navy…would have called it.” This has led to two different ethical approaches, with open areas having a much stronger restoration focus than closed areas, which are preserved. This is in part to manage visitor expectation, “so that you can see exactly what should have been where and why,” as well as avoiding giving “the ship an uncared for look…that reflects in some of the letters we get from visitors, pointing out, or asking why things are in bits or why things aren’t whole.” This also extends to the interpretation of the ship and work with the Exhibitions Manager. In interpreting historic spaces inevitably additions and alterations will have to be made and work goes in to making sure “we are sympathetic to the historic space” by, for example, reusing “refurbished original lights to help recreate the original lighting.” As with conservation work, however, as far as possible any work is reversible, “so any interpretation panels are

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158 Elliott, Mark, interview with author, 18/07/2013
159 Curran, Andy, interview with author, 18/07/2013
160 Elliott, Mark, interview with author, 18/07/2013
161 Curran, Andy, interview with author, 18/07/2013
162 Hall, Richard, interview with author, 19/07/2013
163 Curran, Andy, interview with author, 18/07/2013
164 Hall, Richard, interview with author, 19/07/2013
165 Curran, Andy, interview with author, 18/07/2013
166 Hall, Richard, interview with author, 19/07/2013
167 Curran, Andy, interview with author, 18/07/2013
168 Scott, Elizabeth, pers. comm., 16/08/2013
fixed using tape so if they are removed in the future"\textsuperscript{169} they do not cause lasting damage. These issues highlight “the delicate balance between the…ethical aspect of keeping the ship exactly as it stood when the museum got hold of it, to actually presenting it…as a museum piece so that it can be interpreted for what it was when it was operational.”\textsuperscript{170}

Having HMS Belfast as a museum open seven days a week has an effect not only on which projects are prioritised, but also on how and when projects can be carried out. For example, “if we’ve got any noisy, dirty, messy jobs and we’re on the public route, then it’s best to get them done and out of the way before the public come on board,”\textsuperscript{171} which has led to a shift in working hours, with the Maintenance Technicians starting work at six o’clock, “so we can give them four hours of making as much noise and racket as they can and then we stop them when the visitors come on.”\textsuperscript{172} This attempt at managing the issue, however, is not entirely successful in the view of the Shipwright Officer, Mark Elliott, who believes that “these things do hinder the progress,” with staff having to “go and find something else to do,” often leaving them with the frustration of feeling that with “just one more hour…I could have finished that area.”\textsuperscript{173} As well as having a day to day impact on the work that can be carried out, visitor numbers also have a seasonal effect, with the busiest times of year when there are “about two thousand people a day coming through the ship,” such as the school summer holidays, meaning that there is a need to “try and scale down the space we’re taking up on…our restoration jobs on the upper deck to make sure that as much of the deck is open as possible.”\textsuperscript{174} Conversely, “in the winter we tend to have very few visitors and we take the opportunity to do some of the work that we cannot do with a heavy footfall…like repairing deck coverings.”\textsuperscript{175} The acknowledgement of the need to work around visitors does mean that plans can be made taking this into account, but this is far from an ideal situation and can leave materials in an unstable position if, for example, “there’s an education talk at nine o’clock…and you have to go along and stop them earlier than usual.”\textsuperscript{176}

Individual visitors can also have a huge impact on how successful any attempt to conserve the ship can be, purely by their behaviour. “We’ve noticed that, especially our younger visitors, really like anything that moves” and as a result there’s “quite a few things around the ship that…have been damaged…not in any malicious way, but [due to] the fact that things are a

\textsuperscript{169} Scott, Elizabeth, pers. comm., 16/08/2013
\textsuperscript{170} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{171} Martin, Neville, interview with author, 30/07/2013
\textsuperscript{172} Elliott, Mark, interview with author, 18/07/2013
\textsuperscript{173} Ibid.
\textsuperscript{174} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{175} Ibid.
\textsuperscript{176} Elliott, Mark, interview with author, 18/07/2013
little bit fragile for...the enthusiastic younger visitors generally.”\textsuperscript{177} To combat this and to try to retain and protect as much as possible of the ship’s original fabric, “the museum stopped giving unrestricted...unsupervised access, which is how a lot of things have been damaged in the past,”\textsuperscript{178} and have started “screening using clear acrylic...the bits of equipment themselves to protect them.”\textsuperscript{179} With the issue of damage being identified as a conservation issue, as with equipment that’s “unique, or almost unique, it’s not something you can allow to happen,”\textsuperscript{180} the compromise of this screening goes a long way to manage the detrimental effect that visitors can have on the conservation of the ship. It also avoids issues such as those found on the US battleship North Carolina, where “anything not nailed down will be taken off the ship by visitors,”\textsuperscript{181} although “there’s a couple of times where...we’ve actually locked things away behind gates, purely because we’re worried that bits could be taken or even have bits stolen from us.”\textsuperscript{182}

Visitors are not the only aspect of HMS Belfast’s function as a museum that can cause issues for conservation management. Even though the ship is part of the collection of a national museum, IWM, and therefore has better access to funding than many other ship museums, “as with every museum, we’re working to quite tight budgets, and of course, they’re being reduced year on year at the moment.”\textsuperscript{183} This has an impact on staffing levels, as where “at one time we used to have eight technical staff,” now “you’ve only got four to keep it going.”\textsuperscript{184} This has had a huge impact on the amount of conservation work that can be done, as “the permanent, professional team are actually kept going full time just keeping the ship safe, keeping the structure safe and making repairs as necessary,”\textsuperscript{185} as “obviously health and safety jobs get done ahead of the others.”\textsuperscript{186} To allow conservation work to continue as necessary to avoid unnecessary deterioration, a team of conservation volunteers has been drafted in, and they have taken on projects that the Maintenance Technicians would not otherwise be able to complete “because they’re very time consuming” and “if we start that now, we’re not going to get any of all of these jobs that we’ve got listed” done.\textsuperscript{187} Recently this volunteer team has expanded to work five days a week, and “things are getting done

\textsuperscript{177} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{178} Hall, Richard, interview with author, 19/07/2013
\textsuperscript{179} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{180} Hall, Richard, interview with author, 19/07/2013
\textsuperscript{181} Wallace. The visitor’s battleship. p35
\textsuperscript{182} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{183} Ibid.
\textsuperscript{184} Martin, Neville, interview with author, 30/07/2013
\textsuperscript{185} Curran, Andy, interview with author, 18/07/2013
\textsuperscript{186} Elliott, Mark, interview with author, 18/07/2013
\textsuperscript{187} Ibid.
much quicker because there are more people available to do it on a daily basis.”\(^{(188)}\) There are, however, issues with planning conservation work around volunteers, “as they come and go [and] tend to work for fairly short lengths of time,” meaning that “it is actually very difficult to plan on an unknown workforce.”\(^{(189)}\) There is also an issue of skill-level, and to combat this it is “written into the policy that we would do training” and “exploit the skills they already have and try to give them some basic instruction on skills that they don’t have,” all the while making sure that “everybody’s working safe and knowing their limitations so they don’t actually take on something that could cause more problems than it solves.”\(^{(190)}\)

Funding also affects which projects can be taken on in the first place, and currently “a lot of the projects that we have planed in the long term are likely to be deferred unless we can get backing from corporate sponsors.”\(^{(191)}\) Whilst the Conservation and Facilities Manager, Andy Curran, asserts that “at the moment it’s not a huge problem,” he also recognises that “over the longer term, over the next 25-30 years it could well be,” as “a lot of sponsors are quite happy to take on large projects in the public eye, but really, are not going to put up any money to…have a compartment well below the waterline, well off any visitor routes, to be restored in itself.”\(^{(192)}\) This is clear to see in the projects too large for on-site staff to tackle, that have been completed with sponsorship, and those still awaiting funding. For example, “we’ve got a couple of spaces that are shut off to get some asbestos stabilised,” with the realisation that funding “will have to be found from in the museum itself.”\(^{(193)}\) Whilst this is not dangerous as “the whole place is actually hermetically sealed,” it means “we can’t get in there at the moment, nor to any compartments below there,”\(^{(194)}\) meaning no condition surveys can take place in these areas until the work is completed. On the other hand, when sponsorship is awarded, it can lead to very successful results. After having “identified some problems with the masts”\(^{(195)}\) and having to “cut it down to the level of the funnel and actually leave it until we could find sponsorship to have a new part made,” “out of the blue we had a…Russian firm from St Petersburg, offer to build us a new mast and replace it in its entirety.”\(^{(196)}\) Having “produced all the drawing and documentation we could find from…the refit when [the masts] were first put up,”\(^{(197)}\) the masts were constructed to original specifications and were fitted in

\(^{188}\) Hall, Richard, interview with author, 19/07/2013
\(^{189}\) Curran, Andy, interview with author, 18/07/2013
\(^{190}\) Ibid.
\(^{191}\) Ibid.
\(^{192}\) Ibid.
\(^{193}\) Ibid.
\(^{194}\) Ibid.
\(^{195}\) Ibid.
\(^{196}\) Curran, Andy, interview with author, 18/07/2013
\(^{197}\) Ibid.
October 2010, with “all of the fittings on them [being taken] off, restored and put back onto the new masts.”

There are, of course, other factors not connected to her status as a museum that have an impact on conservation work on HMS Belfast. As she is afloat there is always the issue of the protection of the hull, and although “ships of this era were so heavily engineered the corrosion of hull…is not as big a problem as it would be on a modern ship,” she relies on underwater cathodic protection to keep the steel in good condition. This is due to the fact that underwater surveys are a problem in her current position in the Thames and there are no plans to move her to a permanent dry dock, as “the ideal environment for a ship is to actually be floating” because “ships are designed to withstand the crushing force of water outside, and are not very well suited to remaining out of the water for prolonged periods.” Her position on the river also means that, as Weiner notes in relation to other ships in the US, the “prevention of contamination of local environments and environmental resources by toxic and harmful substances” is very important and can mean that certain substances, particularly certain types of paints which originally “were lead-based…which obviously is poisonous,” cannot be used, forcing the use of modern materials that is to be avoided as far as possible under the Conservation Policy.

As with any large object stored outside, another major environmental concern is the weather, which has an obvious impact on condition of the ship and her fixtures and fittings. Since “the whole of the upper deck’s open…to the wind and rain,” it is exposed to variances in temperature and moisture that speed up the development of corrosion. Positioning also means that there are “slightly different problems between the port and the starboard sides of the ship in that the starboard side is almost permanently in the shade, so we tend to get more corrosion problems than we do on the sunny side,” although understanding this phenomenon can lead

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198 See Figure 11, p36. Photograph courtesy of Andy Curran
199 Curran, Andy, interview with author, 18/07/2013
200 Curran, Andy, interview with author, 18/07/2013
202 Curran, Andy, interview with author, 18/07/2013
205 Elliott, Mark, interview with author, 18/07/2013
206 Curran, Andy, interview with author, 18/07/2013
207 Ibid.
to better conservation planning. The does, however, have an impact internally, in the areas not directly exposed to the elements as, although “we have some ventilation systems, which keeps a fairly stable atmosphere in the inside of the ship… we have very little control over temperatures.”\(^{208}\)

This creates a less than ideal environment for the fixtures and fittings inside as, “in the winter we tend to get a lot of condensation, [and] in the summer it tends to be very hot and humid.”\(^{209}\) This acknowledgement that “the interior of a World War II ship is not very conductive to climate control,” has led to a debate on other ships, such as the USS Kidd, where there is a dilemma over whether to “modify the primary artefact for climate control to protect the smaller artefacts.”\(^{210}\)

The weather also affects working practices, with there being certain conservation and maintenance processes that cannot be carried out in inclement weather. This is planned around to a certain extent with a recognition that in the summer when the weather is fair and “you can get outside and do jobs that can be done…like the upper deck work,”\(^{211}\) these should take priority, with “any things that we are able to remove that can be conserved inside…put…to one side to do when it’s too wet to work outside”\(^{212}\) to ensure that there are never any idle periods. The winter months, are, however, very difficult to work in however much planning is done, as even though “we can work outside in the winter…we can’t do any painting…because of the paint we use it’s got to be about five degrees Celsius…otherwise it just doesn’t work.”\(^{213}\) Any emergency remedial works that arise that by their nature cannot be planned in advance are also particularly vulnerable to the weather, for example “if you’ve got a deck that’s got holes in, it’s leaking…you’re limited sometimes to when you can do that [as] when you’ve got freezing weather or it’s raining all week than all you can do is plug it up and wait for a dry spell to actually get in and do the job properly.”\(^{214}\)

There are clearly many issues that can affect the conservation of an historic ship, such as HMS Belfast, that go well beyond the remit of any conservation plan, even though they can be managed within its frameworks. Many of these can be seen to arise from the decision to open her as a museum. The presence of visitors, both to the museum and as hospitality guests, undoubtedly has a detrimental effect on any efforts to preserve the ship’s original fabric as so

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\(^{208}\) Curran, Andy, interview with author, 18/07/2013

\(^{209}\) Ibid.


\(^{211}\) Elliott, Mark, interview with author, 18/07/2013

\(^{212}\) Hall, Richard, interview with author, 19/07/2013

\(^{213}\) Martin, Neville, interview with author, 30/07/2013

\(^{214}\) Elliott, Mark, interview with author, 18/07/2013
many health and safety adaptations and interpretive additions have to be made to ensure that visitors are not only safe, but leave with a better understanding of her history and significance. The decision to remain open and accept this damage “must be balanced against the long-term cost of the wear and tear on and the general preservation of the object,”\(^{215}\) as, with staff and funding issues as well as the impact of environmental considerations, the ship is becoming increasingly harder to conserve considering that the intended lifespan of a warship “is generally about thirty years,” and HMS Belfast is “well past its operational date,”\(^{216}\) having been launched more than seventy-five years ago. In spite of this, currently the conservation issues that have been identified on board seem to be fairly well managed, with the main objective being the preservation of the ship’s original fabric, even though there are specific acknowledged circumstances in which restoration and replacement have to take place.


\(^{216}\) Curran, Andy, interview with author, 18/07/2013
Figures 10-11

Figure 10: Close up showing serious corrosion on a section of HMS Belfast’s main mast. (Photograph courtesy of Andy Curran)

Figure 11: Installation of HMS Belfast’s new foremast, showing scaffolding where the original mast has been removed. (Photograph courtesy of Andy Curran)
Chapter 4: An Assessment of Conservation on HMS Belfast

Whilst it is possible to assess that the conservation issues affecting HMS Belfast as both an object and a museum are well managed when looking at practices from within, it is important to place the ship’s Conservation Policy and its ethics, objectives and methods in the context of the wider profession of historic shipkeeping to provide benchmarks for assessing success. This includes referring back to NHS guidelines, examining the policies and practices of other historic vessels, both those of differing type and construction as well as other warships, and taking into account visitor opinions and professional accolades and awards. It also offers a chance to examine where there may be room for improvement or a different approach, and an opportunity to look at what the future may hold.

HMS Belfast’s Conservation Policy was formed, and is regularly reviewed and updated, based on industry guidelines and it is therefore no surprise that it considers all of the NHS’ ‘10 Conservation Principles’ referring to significance and its retention; rigorous maintenance and documentation; the avoidance of conjecture; a cautious attitude towards change and the use of the best available knowledge and skills in a logical order with careful planning.\(^{217}\) The policy builds successfully on the professional guidelines available and adapts them to apply specifically to a ship of steel construction rather than wood, and more importantly specifically to HMS Belfast and her individual history, both during service and her time as a museum. As with any conservation plan, however, whilst the significance of the vessel and the reasons for preserving her are unlikely to change, circumstances, resources and changes to legislation may mean that the methods for achieving this preservation and therefore how much is actually achievable may develop over time. It is therefore important that the policy does not remain a static document as it informs all conservation and maintenance work on board and also impacts on exhibition planning and therefore visitor experience.

The fact that HMS Belfast has such a clearly defined policy for conservation management, and has for a number of years, makes it fairly unique as an historic vessel, as “most shipkeepers…[seem to]…run slightly differently to here, and actually just keep a ship presentable,”\(^{218}\) without following any conservation guidelines. Even HMS Victory, one of the nation’s most significant historic ships, is only just beginning to form a conservation plan of its own having recently submitted a set of guidelines,\(^{219}\) along very similar lines to HMS

\(^{217}\) NHS. Understanding Historic Vessels Volume 3, pp.18-21

\(^{218}\) Curran, Andy, interview with author, 18/07/2013

Belfast, to a specialist consultant for delivery in January 2014. Whilst in the US this “stagnation in the way ships are exhibited” and the continued ‘naval’ outlook can partially be attributed to a ‘memorial philosophy’ that is also prevalent in Japan, with the MIKASA concreted to the ground as a memorial, it is perhaps more an indication that the staff on HMS Belfast are leading the way in the development of the field of historic ship conservation. Indeed, the success of processes adopted on board HMS Belfast have, in fact, been recognised by the professional community, with HNSA members “from other ships asking how we’ve gone about things [and] how we operate” to gain advice from a vessel that has been successful at both conservation and operation as a museum. Brad King, Executive Director of Battleship Cove in the US, has gone one step further and is currently working from a “conservation policy document…[that] was created three years ago and uses the HMS Belfast one as a template” for the four ships in their collection that are afloat. This desire from other historic ships to build their own policies based on that of HMS Belfast, coupled with the fact that its author, the ship’s Conservation and Facilities Manager, Andy Curran, “individually…won an award from the Historic Naval Ships Association for the setting up of this conservation system, policy, and maintenance system for the ship itself,” is a good indication that the policy and processes are professionally well respected and regarded as an example of best practice in the field.

Looking at other historic ships, and in particular the Fireboat Alexander Grantham in Hong Kong that has developed as a museum independently outside of the international information-sharing networks, it becomes clear that they face the same problems and indeed often opt for the same solutions as have been implemented on HMS Belfast. The Fireboat Alexander Grantham face the same corrosion issues, even though she rests in dry dock, and the staff similarly carry out an “intensive condition survey” before undertaking any major work. Access issues have also been addressed in a similar fashion by “modifying the cat ladder in the stern into a gentle staircase with handles,” similarly acknowledging the compromise of changing the original fabric in order to “promote the cultural significance in a more user-friendly way for appreciation by a broader audience.” The fireboat has also faced the same

220 Baines, Andrew, Curator & Project Director, HMS Victory, personal communication, 13/08/2013
221 King, Brad, Executive Director, Battleship Cove, personal communication, 12/08/2013
222 Kouta, Greg, Advisor, Memorial Ship MIKASA Preservation Society, personal communication, 28/07/2013
223 Curran, Andy, interview with author, 18/07/2013
224 King, Brad, pers. comm. 12/08/2013
225 Curran, Andy, interview with author, 18/07/2013
227 Ibid. p138
228 Ibid. p136
electrical issues, with a similar need to make “the on-board electricity grid and wiring system conform with current codes and regulations.”229 Whilst all ships are unique and will all face unique problems, the fact that two such different ships on opposite sides of the world have chosen to tackle a number of similar conservation issues in the same fashion shows that the policy and work on HMS Belfast, as on the Fireboat Alexander Grantham, must be the result of careful and logical planning.

It is not just in the realm of historic ships that the conservation management on HMS Belfast has been recognised. W.H. Allen, “a major engineering supplier for the Royal Navy through most of the 20th Century,” presented the ship “with an award for looking after the kit that they were interested in,”230 namely generators and machinery associated with the boilers. The Institute of Mechanical Engineers similarly recognised the ship with a Heritage Award, which “for the last few [years has] been for large objects,” for the ship as a whole and “particularly the main machinery in it.”231 As well as collecting accolades for conserved areas of the ship, the volunteer team that carry out the work have also been recognised by both the London Museum Hub and NHS for their efforts and the hard work they put in to conserving the historic fabric of the ship.232 Most importantly for the ship as a museum, however, is the feedback from the general public, and from the “quarter of a million visitors through the ship each year…with very, very few exceptions we have positive feedback on the way we’re presenting the ship and how interesting it is.”233 This is another clear sign that conservation management on HMS Belfast is along appropriate lines, meeting as it does the preservation criteria and standards of both industrial experts and the more casual observer.

Even though there are many ways in which HMS Belfast’s Conservation Policy and its implementation can be considered successful, as with any policy or undertaking, there are areas where there can be seen to be room for improvement, aside from the obvious need for further funding to achieve goals and the compromises visitor access and hospitality areas force on conservation objectives. One of the major factors holding conservation work on the ship back is the failure of some of the long-standing staff to adapt to the changes in working practice and the adoption of a more ethical conservation approach. There is a negative attitude towards some of the museum’s management who have supported the introduction of the Conservation Policy as “they don’t have anything to do with the Navy or the armed forces…they’ve come from universities and colleges, so they’ve taken their experiences from

230 Curran, Andy, interview with author, 18/07/2013
231 Ibid.
232 Ibid.
233 Ibid.
books rather than life experiences.”

This seems to create a desire to revert to traditional ship maintenance, rather than following the more museum-centred conservation management plan, by assuming that the loss of staff who had been in the Navy and knew “how to look after an old Navy ship and keep the husbandry” and the ensuing shift in conservation focus have had a detrimental effect, with Shipwright Officer, Mark Elliott, going as far as to assert “we done a lot better when we had a lot of ex-navy on here.”

This may also be the root of another of the technical staff, Maintenance Technician, Neville Martin’s inability to acknowledge the ship’s function as a museum, asserting “a museum’s a building, and I don’t class this as a museum [because] we’re not a building.”

This damaging attitude obviously needs to be the focus of discussion with the on-board staff, as it would seem difficult for the Conservation Policy to form the basis of all conservation and maintenance work if there are questions from the staff about its validity.

Looking to the future, there are also new challenges and opportunities on the horizon. There are plans to investigate “docking sometime in five to ten years time to actually check the underside of the underwater part of the ship,” which whilst necessary, will cause a number of problems, not least because there are no longer any Thames dry docks and no longer any local expertise.

Ignoring the expense, which Wallace estimates for a similar ship in the US would be between US$5 and US$40, there are complex issues associated with the “repairs needed to put her into a condition to obtain a license to enter the Channel” and the risks of severe damage or loss that come with long-distance towage. Aside from this planned upheaval, there are, however, no further drastic plans as “we’re a museum [and] we’re going to stay a museum.”

This does not mean, however, that there are no further opportunities for development. Since the Conservation Policy, and preservation and restoration that is ongoing under it, has become such an integral part of work on the ship, there is scope to follow the lead of ss Great Britain. There, although in very different circumstances in dry dock and under a glass skirt, the staff have noticed the benefit of “incorporating conservation into the visitor experience” and the possibilities for revenue that the increased interest can bring.

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234 Elliott, Mark, interview with author, 18/07/13
235 Brooks, Simon, interview with author, 18/07/13
236 Elliott, Mark, interview with author, 18/07/13
237 Martin, Neville, interview with author, 30/07/13
238 Wenzel. ‘Diminishing Shipyard Resources’
239 Wallace, Danielle M. The visitor’s battleship. p20
240 NHS. Understanding Historic Vessels Volume 3. p183
241 Curran, Andy, interview with author, 18/07/13
Currently a great deal of conservation work on HMS *Belfast* takes place along visitor routes, but there is certainly room to make more of a feature to visitors of the methods employed and the reasons behind the ongoing work that is so paramount for the continued presence of such a significant piece of the nation’s naval heritage.

Overall, it is clear that the work that has gone into creating HMS *Belfast’s* Conservation Policy and implementing it to manage the issues that arise from its dual function as both object and museum has not been in vain. The awards and positive feedback from both peers and visitors are a clear indication that the ship is indeed working to a world-class agenda. This is not to say, however, that it is perfect, as there is always scope for improvement whether it be at an internal, staff level or on the presentation side with ways in which conservation can be exploited for possible revenue. As the policy is still fairly new in the history of the ship, time will also tell whether the standards that work has been carried out to are appropriate and effective in the long term, as well as offering up new, perhaps as yet unconsidered challenges.
Conclusion

Through examining the way that conservation issues are identified and managed in theory and in practice on HMS *Belfast*, both those that arise from its status as the largest accessioned object in the IWM collection and those that arise from its function as a successful museum, it was hoped that attention would be drawn to the delicate nature of historic ships and how paramount good conservation practice is in ensuring they survive for future generations. Although “historic vessels are always unique,”243 those chosen to be ‘saved for the nation,’ as HMS *Belfast* has, by virtue all “possess great historical significance and heritage value to society,” and therefore “conservators have an obligation to ensure that the important features of the vessel will be properly preserved for future generations.”244 However, even though there are networks such as National Historic Ships in the UK and others internationally that acknowledge this key role, there is still little information and support on how to carry out conservation work on ships in particular, and thus it represents a developing field for research.

As a result of this lack of industry specific information, there was an underlying need to consider more general theories relating to large and industrial objects, some of which are more relevant to historic ships than others. Whilst this served to highlight the key problems relating to appropriate levels of restoration and the destruction of material evidence through demonstration, outdoor storage and practice akin to a mechanical workshop rather than a museum, it is, perhaps, too broad of a debate in its own right for enough information to be provided to properly frame an assessment of a specific example. It did, however, bring to the forefront the change in attitude of museum professionals who work with industrial objects, locomotives and aircraft towards comprehensive conservation management planning and the utilisation of frameworks designed for historic buildings and places that has more recently begun to transfer to historic ships and is now considered best practice.

With knowledge of how conservation management for historic ships has evolved, the best way to develop an understanding of what conservation plans entail and how their aims and objectives are articulated is to pay close attention to a specific example in the real world rather than concentrating solely on theory. In this instance, HMS *Belfast* provided an excellent case study with a well-defined policy acknowledging that “warship museums inhabit a distinct historical niche combining weapons platform, floating city, artefact, exhibit

243 Tse et al. ‘The Fireboat *Alexander Grantham*’. p140
244 *Ibid.*
spaces, and other museum facilities.”

The policy outlines the vessel’s significance, identifies key problems that may put that significance at risk, and provides key definitions, guidelines and standards for conservation practice, whether preservation, restoration, reconstruction, or a combination of all three. The detailed advice for planning projects and the high level of documentation required means that, in theory, all current and future work will not only serve to preserve the historic fabric as far as is possible, but will also be fully accountable and easily identifiable for future scholars and historians in a way that previous ‘in-service’ maintenance methods were unable to be.

Of course, in practice there are always other issues that need to be taken into consideration that can make working under a conservation plan difficult. In the case of HMS Belfast many of these stem from the presence of visitors and include the health and safety and access alterations they require to be on board, as well as the physical degradation and damage to the original fabric they can cause, but funding and management issues as well as environmental pressures also have an impact. HMS Belfast has, however, shown that by taking steps to manage these problems, many of which are likely to occur on other historic ships, they do not necessarily have to hinder progress or overly compromise preservation goals.

Indeed, HMS Belfast’s successes have been recognised internationally with conservation and heritage awards as well as impressive visitor figures, with her policy now acting as a template for other ships and her staff providing advice to the global heritage fleet. Although not perfect and as yet untested over time, there is perhaps the possibility that HMS Belfast could become a model for good conservation practice on historic ships as long as there is a clear understanding in vessels wishing to follow in her footsteps that “economic compromise will always be a factor in the historic ship business” and “even in ideal circumstances, with a healthy financial base and plenty of enthusiasm, preservation can only be undertaken successfully if there is a sufficient well of practical experience and skills to draw upon, as well as reasonable access to essential raw materials and specialised facilities.” It is perhaps due to a lack of any one of these resources - which are fortunately currently available to HMS Belfast - that so many other vessels are failing in their efforts at conservation and have in fact, been lost or deconstructed. Whether or not this is the case, an examination of conservation strategies on historic ships that have failed would certainly make an interesting counterpoint to this study.

245 Lamm, Marshall B. *Floating Fortress, Floating City, Floating Monument.* p1
246 Rizzuto. ‘Setting Priorities Aboard USS Kidd or The Confessions of a Marginal Operator’
247 Wenzel. ‘Diminishing Shipyard Resources’
Although conservation management and planning is definitely something best examined from the museum’s perspective as the staff are those actively involved in carrying it out, there is also a great deal of scope for further research on how conservation is viewed by visitors and how far their understanding of what is involved stretches, whether through questionnaires or simply observation. It would also be interesting to investigate NHS as an organisation, its involvement with the government, and its advisory role in conservation issues affecting historic ships.
Appendix 1

Information Sheet for Participants

Project Title: ‘Keeping Things Shipshape: Conservation Management on HMS Belfast’
Contact Address: 30 Albert Square, London, SW8 1DA, aef14@student.le.ac.uk

Date: 18th July 2013

Dear participant,

I am very grateful that you are taking the time to consider participating in my research project ‘Keeping Things Shipshape.’ I would like to take this opportunity to tell you more about the nature of the project, who I am and why I am undertaking this research, and how you were selected for the project. I would also like to inform you about how the data you supply to me will be used and the protections of your privacy and confidentiality that are in place.

Who is doing the survey
Amy Foulds, MA distance learning student, University of Leicester

What is the project/survey for
To develop a better understanding of the differing ethical and practical approaches to the conservation of a large, industrial object, such as HMS Belfast, to that of more traditional museum objects, as well as the issues that can arise from, for example, having to comply with legal frameworks to allow public access as a museum and how these are managed. Also, to gain an understanding of how interpretation for the visiting public of different periods of the ship’s history and its memorial role can affect conservation plans.

How you were selected
Through research on the IWM website and initial contact with the museum, you were identified for selection as being directly involved in conservation processes.

Your role in completing the project/survey
A face-to-face recorded interview lasting approximately 45 minutes at the agreed date and time, with the possibility of some follow up questions via email at a later date. The scope of the questions will be provided via email in advance to allow time for any necessary preparation. There will be other interview participants with similar relevant experience from within the same organisation and email correspondence with professionals from other organisations around the world.

Your rights
Your participation in this research is entirely voluntary and you are free to withdraw from the project at any point. If you are uncertain or uncomfortable about any aspect of your participation please contact the researcher listed at the top of this letter to discuss your concerns or request clarification on any aspect of the study.

Protecting your confidentiality
Any information you supply will be treated confidentially. Interview recordings and any email correspondence will be stored on a secure hard drive and any printouts will be stored in a locked drawer. All participants have the option to remain anonymous in all written work if they so wish. Currently this research is for the sole purpose of achieving a MA in Museum Studies and there are no plans for publication, but you will be contacted again with further information if this were to change.

If you have any questions about the ethical conduct of the research please contact the School Research Ethics Officer, Giasemi Vavoula, gv18@le.ac.uk.

Thank you very much for participating,

With best wishes,

Amy Foulds
The dissertation 'Keeping Things Shipshape: Conservation Management on HMS Belfast' is research towards a MA in Museum Studies at the University of Leicester.

This project will be carried out in accordance with the University of Leicester’s Code of Research Ethics, which can be viewed at [http://www2.le.ac.uk/institution/committees/research-ethics/code-of-practice](http://www2.le.ac.uk/institution/committees/research-ethics/code-of-practice)

Participants may keep the Information sheet about the project for their records.

Material provided as part of this study will be treated as confidential and securely stored in accordance with the Data Protection Act 1998.

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Appendix 2

HMS BELFAST

CONSERVATION POLICY

2012
1 BACKGROUND

1.1 Operational History

HMS Belfast is an improved Southampton-Class light cruiser, the last remaining_big-gun armoured warship from the Second World War in Europe. She was built by Harland and Wolff in Belfast, and was launched on St Patrick’s Day, 17 March 1938, by Mrs Neville Chamberlain, the wife of the prime minister. On 5 August 1939 she was commissioned by Captain G A Scott DSO RN as a cruiser in the Home Fleet. Less than a month later, Britain was at war with Germany.

HMS Belfast joined the Northern Patrol based at Scapa Flow, the Royal Navy's base in the Orkney Islands. She kept watch between the British Isles and Iceland, intercepting merchantmen which might be carrying cargoes destined for Germany. On 9 October she stopped the German liner Cap Norte, which was trying to reach home from Brazil disguised as a Swedish ship. A boarding party from HMS Belfast took possession of the ship, which was escorted to Kirkwall and her crew interned.

On 21 November 1939, whilst leaving the Firth of Forth to conduct gunnery practice, HMS Belfast was severely damaged by a German magnetic mine. Although casualties were mercifully light – 16 men were injured, one later dying in hospital - the ship's back was broken. Repairs effectively amounted to a complete rebuilding of the midships section of the hull and it was almost three years before she was fit for action again.

In September 1942, under the command of Captain F R Parham DSO RN, HMS Belfast returned to Scapa Flow and became the flagship of the 10th Cruiser Squadron, under Vice-Admiral R L Burnett. She then provided cover for the Arctic convoys transporting supplies to the Soviet Union.

On Boxing Day, 26 December 1943, HMS Belfast played a leading part in the destruction of the German battle cruiser Scharnhorst at the Battle of North Cape. At one point HMS Belfast was shadowing the German battlecruiser alone as the latter tried to escape back to her base in Norway and had Scharnhorst turned to fight HMS Belfast's destruction would have been certain. As it was, every 15 minutes HMS Belfast passed on the Scharnhorst's position and course to the Commander in Chief, Home Fleet, Admiral Sir Bruce Fraser. He was approaching from the south in the battleship HMS Duke of York at high speed, cutting off Scharnhorst's escape route. Outgunned by the battleship and relentlessly pounded, Scharnhorst sank at around 1925 hours. Only 36 men were rescued from the ship’s company of 1800.

In June 1944 HMS Belfast took part in the D-Day landings as the flagship of Bombardment Force ‘E’ of the Eastern Naval Task Force, providing gunfire support to troops landing on Gold and Juno beaches. On 10 July she returned home for a refit and then left home waters on 17 June 1945 to become the flagship of the 2nd Cruiser Squadron of the British Pacific Fleet. However, before she could see action the war against Japan ended and her first mission was a mercy dash to Shanghai, to bring aid to released internees of the Japanese.

Between 1950 and 1952 HMS Belfast supported United Nations forces in Korea, where she was referred to as, “that straight-shooting ship” by an American admiral, impressed by the speed and accuracy of her gunnery. On 29 July 1952 HMS Belfast sustained her first battle damage of the Korean War, when she was hit by a 76mm shell. One man, a Chinese rating from Hong Kong, was killed and four others were seriously injured.

Between 1956 and 1959, HMS Belfast underwent an extended programme of modernisation. Amongst the more obvious changes were the construction of an air-tight “citadel” enclosing the bridge superstructure, lattice masts, and the replacement of all close-range armament with
six 40mm twin Bofors Mk V mountings. She was recommissioned at the end of 1961 and undertook two lengthy overseas commissions, the last of which took her home from Singapore via destinations as diverse as Australia, East Africa, Canada and the United States.

After steaming nearly 600,000 miles during her working life, HMS *Belfast* went into reserve for the last time at the beginning of 1965. In May 1966 she became an accommodation ship for the Portsmouth Reserve, and in May 1971 she was prepared for sale and scrapping. To save her from this fate an independent trust was formed, led by one of HMS *Belfast*’s former captains, Rear-Admiral Sir Morgan Morgan Giles. The trust succeeded in acquiring the ship and brought her to London where she opened to visitors on Trafalgar Day, 21 October 1971. HMS *Belfast* has been part of the Imperial War Museum since 1978 and is the first ship to be preserved for the nation since Nelson's *Victory*.

### 1.2 Ship Specifications

| Class: | Edinburgh, Modified Southampton-Class |
| Sister ship: | HMS *Edinburgh* (sunk May 1942) |
| Built: | Harland and Wolff Shipyard, Belfast. Keel laid 10 December 1936 |
| Launched: | 17 March 1938, St. Patrick's Day |
| Commissioned: | Commissioned into the Royal Navy 5 August 1939 |
| Standard displacement: | 11,553 tons |
| Overall length: | 613 feet 6 inches (187 metres) |
| Beam: | 69 feet (21 metres) |
| Draught: | 19 feet 9 inches (6.1 metres) |
| Armament (1959): | Twelve (4x3) 6-inch; eight (4x2) 4-inch HA/LA; twelve (6x2) Bofors AA |
| Propulsive machinery: | Four Admiralty 3-drum boilers; four steam-powered Parsons single reduction geared turbines driving four shafts at 80,000 shaft horsepower |
| Maximum speed: | 32 knots (36 miles/58 km per hour) |
| Complement: | 750-950 (as flagship) |
1.3 Technical History

10 December 1936  Keel laid. Harland and Wolff, Job Number 1000.

17 March 1938  Launched by Mrs Neville Chamberlain, wife of the prime minister.

3 August 1939  Completed, fitted out as a flagship.

5 August 1939  Commissioned, Captain G A Scott DSO RN in command.

21 November 1939  Struck a mine in the Firth of Forth; subsequently towed to Rosyth Dockyard. Temporary repairs were carried out. The engines were realigned and the hull patched ready for moving to Devonport (28 June 1940).

1 August 1940 to 31 October 1942  Major reconstruction and refit at Devonport Dockyard. The ship was straightened and strengthened; a bulge was added to the hull to increase longitudinal strength and increase stability. The paravane arrangement was modified and additional breakwaters fitted at the forward end of the 1 deck waists. The forward whaler davits were removed and the area plated over. Bullet-proof plating was fitted around the 4-inch gun positions and sliding doors fitted outboard of the torpedo mounts. The gantry for the 32 foot cutter was extended to clear the bulge and carley float racks fitted to the after superstructure. A motorboat workshop was created abaft the forward funnel. A radar office was created behind the forward 6 inch director and bulletproof plating fitted around the bridge. Degaussing coils were installed and provision made for fuelling smaller ships at sea. Finally the ship was painted in Admiralty disruptive camouflage.

18-29 June 1943  Repairs at Rosyth Dockyard. Sheet anchor was removed and hawsepipe plated over. The carley float stowages were rearranged.

July 1944 to 17 April 1945  Tropical refit at Middle Dock & High Shields Engineering Company, on the Tyne. Two 44 inch searchlights were removed. Aircraft catapult was removed and hangars were converted for use as accommodation. S3 and P3 4 inch mounts were removed and the remaining mounts were modified to remote power control. Auto selector control was fitted to the high angle control system tables. Two eight barrelled Pom-Pom mounts were upgraded for remote power control. Four, four barrelled Pom-Pom mounts were fitted on after superstructure. Six twin power operated Oerlikon mounts and six twin hand operated mounts were fitted to the forward superstructure and 1 deck. Two single Oerlikon mounts were sited on after superstructure.
Provision for replenishment at sea was installed.

**August 1945**  
Short refit at Sydney, Australia.  
Four single barrel Mark XIV Bofors were fitted on either side of lower bridge and outboard of mainmast.  
Three single barrel Mark III Bofors were installed on lower bridge wings forward and atop B turret (replacing twin Oerlikon).

**February 1946**  
Sydney, Australia.  
Torpedo outfit and depth charges removed.

**16 May to 15 July 1946**  
Singapore Dockyard.  
Upgrade to ventilation and air conditioning was carried out. Scuttles which had been blanked during the war were reinstated and extra scuttles fitted (all eight feet or more above waterline).  
Derricks were fitted at the Quarterdeck and B turret deck for ammunitioning at sea.  
Admiral’s quarters and staff areas were improved, also communications systems.

**6 December 1946 to Spring 1947**  
Repair period at Hong Kong.

**15 October 1947 to 15 October 1948**  
Long refit (Reserve Fleet).  
Major maintenance programme was carried out on main machinery.  
Four single Bofor mounts were added, adjacent to funnels.

**23 January 1950 to 14 March 1950**  
Refit at Singapore.  
Six tachymetric directors replaced the Pom-Pom directors.  
Rangefinder was removed from the forward 6 inch director.  
Baths were replaced by showers throughout the ship.  
Additional cold and cool rooms were fitted.  
Sick Bay was supplied with air conditioning.  
Sounding machine and boom were removed.  
Two forward 20 inch signal projectors were removed.

**1 June 1951 to 16 August 1951**  
Refit at Singapore.

**6 January 1956 to 12 May 1959**  
Extended refit at Devonport Dockyard.  
Air-tight “citadel” created; most of the exposed part of 2 deck was plated in. Enclosed bridge was built into modified forward superstructure. The superstructure also incorporated the Operations Room, accommodation, Charthouse, Admiral’s Bridge and staff compartments.  
Accommodation was modernised and provision made for a complement of up to 956.  
All main bulkheads, with the exception of 117 and those through the after officer’s accommodation, were made watertight up to 2 deck. This was to improve the watertight integrity of the vessel.  
Prewetting arrangements were installed.  
Cleansing stations were incorporated at 2M1 and 01G aft.  
The tripod masts were replaced by lattice masts.
With the exception of the quarterdeck and waists, all wooden decking was removed.
Main director control towers were replaced with 6 inch directors fitted with RP40.
The fire control tables were modernised.
Four twin 4 inch mountings were replaced with RP51 Mark XIX mountings.
Four MRS8 blind fire directors replaced the three high angle control towers.
All close range armament was removed and replaced with six twin Bofors Mark V mounts.
Four MSR8 Bofor directors were fitted, two forward and two aft.
The barrage director was removed.
Asdic was upgraded to Type 174/176.
Additional internal and external communications systems were fitted.
Full overhaul of main machinery was carried out and various improvements were made to auxiliary machinery.
Modern radar and communication outfits were installed.


14 July 1961 to 5 August 1961 Refit at Singapore.

4 October 1971 to 14 October 1971 King George V Dock, Woolwich. Preparations were made for opening as a museum in the Pool of London. Bearers were added to the port side, and a landing for gangways fitted.

June 1999 Portsmouth Dockyard. Programmed docking for repainting of underwater section of the hull up to the upper deck.
2 PAST WORK AND PRACTICES

The main challenge faced when preserving a structure primarily made of steel is that of arresting corrosion.

During her time since retiring from the Royal Navy, HMS Belfast has undergone many types of anti-corrosion treatment. These include cocooning, preservative grease, painting and glass fibre encapsulation.

Records have not been kept as to when, how or why the coatings were applied. However, all cocooning and fibreglass have now been removed. Areas of deck under fibreglass were found to be heavily corroded due to ingress of water having gone unnoticed for many years.

Much of the detail in the fixtures and fittings of the ship has been hidden by the liberal application of many coats of paint over the years.

In some areas, such as the messdecks in H and J sections, all furniture has been removed from the ship, leaving large open spaces.

In the officer’s accommodation areas on 1 and 3 decks, the creation of offices has left few of the original fixtures and fittings in place.

The forward and after heads have been stripped out, to make way for the installation of public toilets.

All boats have been removed from the ship.

Four function areas have been created: the Admiral’s Quarters, Wardroom, Ship’s Company’s Dining Hall and starboard Senior Rates Mess, now called the Gunroom. In addition a café has been created from the port Senior Rates Mess.

The officer’s galley is still in use, though it has been completely renovated and has been fitted with modern equipment.

3 ETHICS OF CONSERVATION

3.1 Conservation Objectives

To preserve the structural and historic fabric of the ship and her fittings, generally based on her 1959 configuration.

To display artefacts in their correct context with respect to location and era.

To present HMS Belfast in her best possible state, in order to give an understanding of the operation, character and habitability of a cruiser built in the first half of the twentieth century.

To manage changes made to improve the quality of the visitor experience and minimise risks, whilst maintaining the character and integrity of the ship.

To manage changes made to maximise income generation prospects aiding the long term sustainability of HMS Belfast.

To present an educational experience to visitors, whether formal or informal learners, that reflects the living and working environment of the ship’s company over various periods of the ship’s operational life.

To maximise all resources at the disposal of HMS Belfast.

To maintain a record of all conservation work carried out.

3.2 Conservation Definitions

3.2.1 Preservation

The process of maintaining the original condition of the object. Minimum intervention is used to ensure that the life of the object is maintained for as long as reasonably practicable. This
may include stabilising corrosion or relocating the object in order to reduce deterioration. Maintenance routines can be planned to monitor objects and adapt treatments as required.

3.2.2 Restoration
Recovering the original features of the ship and fittings to a predetermined point in time. For most equipment and compartments, this will be at the end of the modernisation refit in May 1959. In some cases this may mean removing or replacing later fittings. To ensure accuracy, photographs and ships drawings should be referred to in conjunction with the survey.

3.2.3 Reconstruction
Returning the ship, its fixtures and fittings back to a known condition which may involve using modern materials and processes. Reference should be made to the ships drawings to establish the original materials used.

3.2.4 Planned Maintenance
The planned processes used to protect the condition of the hull, fixtures, fittings and exhibits. At present a computer based management system is used to plan and record conservation maintenance carried out.

3.2.5 Fabric of the Ship
The materials used in the construction of the ship and any repairs alterations or additions made thereafter.

3.2.6 Integrity
The historical accuracy of the ship, fixtures and fittings.

3.3 Conservation Principles
HMS Belfast is a unique example of a mid twentieth century warship. The ship itself represents a physical record of her construction, modernisation, history and operation.

Every effort should be made to preserve her in her current state. Addition or removal of original structure or fittings should not be undertaken except as a last resort. For example, provision of wheelchair access.

It is recognised that the ship underwent many changes over time, both during her operational life and her time as a museum. Where changes have developed a historical interest, they should be preserved and maintained.

Examples of construction techniques used in the building, alterations and subsequent repairs to the ship using traditional skills are key features of the vessel and should be retained.

Fixtures, fittings and finishes with historical significance are to be repaired where possible. Replacements will be considered where repair is not considered viable or where there is a risk to the safety of visitors, staff or the structure itself.

Replacement of components beyond repair or missing, should be based on the materials originally used, date of manufacture and finish. The ships drawings, photographs and reference books are invaluable in the selection.

It is recognised that metals require good preparation to ensure that preservatives are effective, traditional methods for the preparation of steel can involve needle guns and shot blasting. The gentlest process possible should be adopted for the preparation of materials, either by chemical or mechanical processes. This also applies to general cleaning and polishing.
3.4 Conservation Practice

All work carried out on HMS Belfast will be in accordance with the policies laid out in this conservation document.

Prior to any repairs or alterations being started, a file is to be created for the entity. It should contain a material survey detailing the materials used, manufacturers, the state of the materials and references to all documentation available. Photographic records should be made at this time to support the survey. This will become a dynamic document used to record all work carried out in the future. It will also cross refer to the maintenance management database using the asset code.

All preservation, restoration and visitor access work will be planned to minimise damage to, or removal of, the original fabric.

Where possible repairs should be made using historic fabric and traditional repair methods. If this is not possible on the grounds of health and safety or cost, then the process used should be reversible.

Asbestos is known to be present in HMS Belfast. The asbestos register is to be consulted prior to any work taking place. Great care should be taken to avoid damage to the encapsulation systems in use on the ship.

The maintenance management system is to be used to plan and record maintenance and defect rectification works.

Over coating of paint systems should be used as a last resort. Painted surfaces should be washed down as a general treatment. Where painting is carried out, it is to be in accordance with the scheme of painting and in agreement with the Conservation Manager.

4 RESOURCES

4.1 Ship Staff

- Management Team
- Technical Department
- Yeomen Staff (Operational)

4.2 Veterans

- Past crew members of HMS Belfast, willing to help interpret the ship and aid educational initiatives.

4.3 Volunteers

- Interested individuals, who carry out conservation, maintenance and repair duties on a formal part-time basis. They work to the conservation plan under the guidance and management of the Conservation Manager.

4.4 Maintenance Management System (MMS)

- This system of codes is used to record all the assets on board HMS Belfast along with their associated planned maintenance tasks. These asset codes are also used throughout the conservation file system for ease of reference.

4.5 Compartment Database

- A database detailing the state of compartments, their past, present and future planned usage. This is cross referenced to the MMS.
4.6 Conservation Plan

- A prioritised list of projects planned but awaiting adequate resources in order to be started.

4.7 HMS Belfast paint scheme

- The 1959 scheme is used as a guide for preparation and painting. This is only relevant to the internal compartments of the ship, since externally the ship is in her disruptive camouflage scheme.

4.8 Ships Outfit of Drawings

- A set of drawings from various stages of the ship’s life, covering many different aspects of the ship. Although not a comprehensive set, it is a good reference for general conservation work. The drawings are catalogued in a database for ease of access.

4.9 End of Refit Photographs

- A set of 350 photographs taken in 1959 at the end of the extended refit. These cover a limited number of areas and are extremely useful guidance for creating specifications for work.

4.10 Fittings and Compartment Surveys (continuing)

- Created in conjunction with the Maintenance Management System by surveying components of the ship and producing specifications of work required for each item or area. These are backed up using digital photographs as a reference.

5 PROFESSIONAL and ETHICAL STANDARDS

Once the initial survey has been carried out on an artefact, whether it is a fitting, compartment or part of the structure, a conservation plan can be put in place. The appropriate processes required may be preservation, restoration, reconstruction or combinations of the three. In most cases priority should be given to preservation.

All processes are to be recorded in the Conservation File along with any notes which explain why particular processes were adopted.

5.1 Integrity of the Artifact

The long term preservation of any artifact is the primary concern when deciding on treatments to be adopted. The value or lack of apparent value of the artifact should not influence the decision to adopt a particular process or methodology.

The artifact should retain as much of its original physical features as possible once conservation processes have been applied.

5.2 Competence

Conservation is carried out by a workforce of varying abilities and experience. All staff whether voluntary or permanent should be aware of their competence and experience and not attempt treatments beyond their known abilities.

5.3 Standards of Work

All staff whether voluntary or permanent working on conservation projects should work to the highest standards possible. The opinion of the individual as to the value or relevance of the artifact should not affect the approach to conservation. This also applies to the selection of process to be carried out.

5.4 Selection of Processes

Care is to be taken to ensure that processes specified or actually carried out on artifacts will not have a detrimental effect.
Time, cost or effort should not sway any decisions made. The integrity of the artifact is paramount.

5.5 Reversibility

As a general rule, all processes carried out on artifacts should be reversible. Where this proves to be impossible, the factors considered should be clearly recorded in the Conservation File.

5.6 Limits of Restoration

When restoring the ship, fixtures, fittings or compartments care should be taken to ensure that improvements are avoided.

5.7 Training

HMS Belfast is a unique environment for conservation; there are few references on the subject of Warship Preservation. HMS Belfast has adopted an internal training scheme as described in Annexe A.

6 CONSERVATION PROJECTS

6.1 General

Conservation projects will be undertaken by a team as directed by the Conservation and Facilities Manager. Each team will have a nominated Team Leader responsible for ensuring the work is undertaken and documented as laid down in this document.

6.2 Documentation

It is essential that comprehensive documentation is produced and maintained:

- To provide a historical record
- To keep track of progress
- Ensure continuity of a project
- As a basis for future conservation

The prime documentation will consist of Surveys (see 6.3 below), photographs and drawings. All applicable documentation will be held on the Conservation drive of the IWM server and details of filing conventions are in ANNEXE C - Conservation Assessment Survey Instructions

6.3 Surveys

To ensure the future preservation of historic artefacts, detailed documentation of all work undertaken is essential. The prime document is the Conservation Assessment Survey form (see ANNEXE B). An initial survey will be completed for each asset prior to commencement of work, and this will be supplemented by sub surveys, photographs and drawings of various parts of the asset as the project progresses. Where no previous conservation documentation for an asset exists it will be the responsibility of the Team Leader to agree a suitable sub-division of the asset with the Conservation Manager. The surveys should be updated regularly to create a record of the condition of the asset and of work undertaken to conserve it. The documents will be stored in the Survey folder for the asset being conserved

6.4 Planning

A plan should be drawn up as early as possible that identifies the major tasks to be undertaken and highlights any issues that need resolution before progress can be made. The plan should be updated regularly to reflect additional tasks identified and to mark progress. An Excel spreadsheet can be used for this purpose, and the document stored in the Survey folder for the asset being conserved
6.5 Items Removed for Conservation

Before items are removed either a photograph should be taken or a drawing made to facilitate subsequent re-instatement. Each item removed should be labelled and a record maintained that indicates the current status and location. Loose items (e.g. fixing bolts) should be placed in a suitably labelled container until required for re-assembly. An Excel spreadsheet can be used for this purpose, and the document stored in the Survey folder for the asset being conserved.

7 HMS BELFAST FUTURE PROJECTS

At present almost half the ship is open for public access and viewing. Areas which are not open are excluded for various reasons: difficult access, administrative use, educational use or corporate function use.

Where possible, an example of each type of compartment has been made available for viewing. This is supplemented by a “virtual tour” sited on the main communications deck, which allows sight of 10 inaccessible areas.

Resources for the conservation of the ship are finite and a balance has to be struck between restoration and maintenance. Various projects have been identified as significantly important to the ongoing policy of increasing access and improving the visitor experience. These are listed in Annexe F.

8 CRITICAL ISSUES

Preserving HMS Belfast in her present condition is a delicate balance, taking into account the safety of visitors and staff, the availability of appropriate materials and their fixings, the ability to use traditional methods of repair and cost. Another major factor is the need to create space for the administration of the ship and to supplement income with various initiatives.
ANNEXE A – Restoration of Heritage Areas – Internal Training Scheme

Aim: to establish a common method of restoring internal compartments on HMS Belfast by all staff and volunteers.

The training course will enable all participants to complete small conservation projects confidently and competently, with the minimum of supervision. The course will cover:-

1. Conservation filing system and conservation surveys.
2. Use of historic resources to aid planning.
3. Methods and media used to record work carried out.
5. Safe use of hand tools.
6. Identification and treatment of the various types of materials used throughout the ship.
7. Treatment of minor corrosion.
8. Methods of preparing surfaces.
9. Applying appropriate finishes.
10. Reporting actions taken and problems encountered for entry in the conservation file.

These courses will be run over a period of time for one forenoon per week, in order to reduce the impact on the running of HMS Belfast.

Training will be presented wholly at the place of work; administration and records will be under the supervision of the Conservation Manager and site work will be delivered by the nominated Museum Technician.

Sections 1-4 will be undertaken on Day 1.

The remaining sections will be delivered over the duration of the project and will be workload dependant.

Once a training course has been successfully completed, a record of competency will be entered in the training database.

TRAINING SCHEDULE

Section 1 – Conservation Manager
Conservation filing system and conservation surveys
Introduction to the conservation filing system and an explanation of how this ties in with the ship’s planned maintenance system and database.

An explanation of the need for recording work carried out, establishing a baseline before work begins, and recording the current state of the area.

How to carry out an initial survey and assist in a detailed survey, which is used to create a programme of works for the project.

Section 2 – Conservation Manager
Use of historic resources to aid planning
Introduction to the drawings database and methodology used to catalogue the numerous documents available. Tips on searching and use of Queries in MS Access.

Familiarisation with the post-modernisation photograph library.

Other sources such as HMS Belfast Association, internet and reference books.

Section 3 – Conservation Manager
Methods and media used to record work carried out
Point out the various methods which can be used to keep an accurate record of the progress of the project. Digital photographs, notes, material sampling, diary etc.
Consider the options of creating and maintaining a progress diary on the ship’s web pages.

**Section 4 – Conservation Manager**

**Health and Safety**

It is highly likely that the restorer will come into close contact with various chemicals. Checking COSHH datasheets for new chemicals, and reading existing COSHH risk assessments for existing ones, are extremely important. Describe how the documents are created, where they are located and who to ask if there is any doubt.

A brief description of manual handling assessments and risk assessments.

Identification of asbestos-based products, what to do and who to inform if the material is found. Introduction to the control of asbestos files.

Stress the importance of isolating supplies when in close proximity to electrical apparatus, and how to arrange it.

**Section 5 – Museum Technician**

**Safe use of hand tools**

Although it is unlikely that a wide selection of tools will be required for most internal restoration projects, it is important that the restorer knows the hazards of using hand tools. Brief description of the methods of handling, using and storing common workshop tools. Power tools are not expected to be used for these projects; their safe use will be addressed separately if circumstances change.

Care of paint brushes, rollers etc.

**Section 6 – Museum Technician**

**Identification and treatment of the various types of materials used throughout the ship**

The ship is made up of various materials which will need to be identified and treated appropriately. Describe how to differentiate between various substances and where to seek advice if in any doubt.

Describe the various processes used with common materials; point out the modern equivalents where traditional finishes can no longer be sourced.

**Section 7 – Museum Technician**

**Treatment of minor corrosion**

Refer to the specification of conservation paintwork in the Planned Maintenance System.

Point out areas where corrosion is most prevalent, such as areas where there have been leaks, compartments containing acids or the junction of dissimilar metals.

Describe how corrosion is managed on a small scale. Name the chemicals used in HMS Belfast and their advantages in various operations. i.e. remove and treat or, for permanent structures, treatment in situ. Where heavy corrosion has been found the technical team will invariably be involved.

**Section 8 – Museum Technician**

**Methods of preparing surfaces**

Removal and replacement of tallies and fittings.

Explain the differences between preparing wood, metal and soft surfaces.

Describe how to make minor repairs to lagging (except asbestos).

Stress the importance of applying paints to clean dry surfaces.

**Section 9 – Museum Technician**

**Applying appropriate finishes**
Point out the ship’s painting scheme. Identify which modern paints have superseded the types used during 1950s.

Point out the various primers used for different materials.

Describe the advantages and disadvantages of brushes, rollers and spray paint applications.

**Section 10 – Conservation Manager**

*Reporting actions taken and problems encountered for entry in the conservation file*

Stress the importance of keeping notes.

Reiterate the systems used to record work carried out.

Feedback for improvements or omissions.
# CONSERVATION ASSESSMENT SURVEY MASTER

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<tr>
<th>ASSET No.</th>
<th>NAME</th>
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<table>
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<table>
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## Applicable Documentation

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## MAJOR COMPONENTS

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## GENERAL CONDITION

### DAMAGE

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<tr>
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</tr>
<tr>
<td>Old Repairs</td>
</tr>
<tr>
<td>Dirt</td>
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### Actions Required

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<th>Work required.</th>
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## Additional Surveys

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<tr>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

## Special Display Requirements.

## Actions Taken
ANNEXE C - Conservation Assessment Survey Instructions

Instructions for filling out Conservation Assessment Survey forms.

(Form CASMaster.doc)

This form is for use as an initial assessment of compartments and equipment fitted. It will be used as a tool for prioritising future works and as a record of fittings and the general state of them.

This will be followed up by a detailed specification of works to restore or conserve individual items of equipment. It also gives information on setting up a project file and guidance for recording works carried out.

<table>
<thead>
<tr>
<th><strong>Asset No.</strong></th>
<th>Taken from the Maintenance Database. If the asset is not already listed an entry is to be made. (Also note the correct location)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name.</strong></td>
<td>Name of the person carrying out the survey.</td>
</tr>
<tr>
<td><strong>Description.</strong></td>
<td>A very brief description of the fitting.</td>
</tr>
<tr>
<td><strong>Location.</strong></td>
<td>The name of the compartment or area, as it appears in the maintenance database.</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td>Date survey was undertaken.</td>
</tr>
<tr>
<td><strong>Manufacturer</strong></td>
<td>Usually found on makers plate.</td>
</tr>
<tr>
<td><strong>Applicable Documentation.</strong></td>
<td>List drawings, books, photographs etc. Use drawings database for reference and use ranges for listing. D-Drawing, B-Book &amp; P-Photograph</td>
</tr>
<tr>
<td><strong>Major Components.</strong></td>
<td>A straightforward list of the main parts of the object. For small objects this will not be necessary.</td>
</tr>
<tr>
<td><strong>General Condition.</strong></td>
<td>An overall evaluation of the object taking all components and materials into consideration.</td>
</tr>
<tr>
<td><strong>Damage.</strong></td>
<td>List any major areas of damage or deterioration under the headings provided.</td>
</tr>
</tbody>
</table>

**Actions Required.**
This will be agreed with the Conservation Manager prior to any works. The priorities are time based; being :-

1. Immediate; works required to prevent total destruction.
2. Within 1 month; works required to stabilise problems, which will escalate quickly if not treated.
3. Within 2 months; minor repairs can which can be made with minimum impact on planned maintenance and conservation.
4. Works, which can be programmed into the three year plan. Regular monitoring regime to be put in place until a permanent repair or stabilisation is affected.

**Notes.**

- Make full use of photographs to create an accurate record.
- Insert lines in tables as required.
- Check the Drawings database for relevant information.
- Further more intrusive surveys may be required once work is underway.

**Setting up a new conservation project documentation file.**

Determine asset reference from Maintenance Management System (MMS) and note.
Open Folder G:\TECHNICAL\Conservation\0NewProjectForm.
Copy Folder AssetNo, to Conservation Folder. (Up one level)

Rename Folder from AssetNo to the actual Asset Reference found in the MMS.

All the forms required for the project are in the main asset folder in the conservation directory.

Note  Compartment records are saved by deck and section in a folder called Compts. All assets prefixed ZOM are to be saved in these folders and not the main conservation folder.

All documentation for any given asset should be included in a folder named for the asset number (e.g. GMB004).

The documentation should comprise three sub folders:

- Surveys
- Photographs
- Drawings
- InfoDocs

Surveys
1. There will be an initial survey supplemented by a number of sub-surveys to describe its various parts. Due to their diverse nature, these sub-surveys will vary from asset to asset, and may also evolve as the conservation of any given asset progresses.
2. All surveys will utilise the Survey form; this is available as a Word template. For the first asset of any given type, determining the structure of the sub-division of surveys will rest with the Team Leader in consultation with Conservation Manager.
3. Subsequent projects on similar assets will follow the established structure.
4. Where two similar assets are being restored simultaneously, the survey sub-divisions will be harmonised; the Team Leaders concerned will be responsible for this.
5. Each survey and sub-survey should be given a meaningful file name that will enable identification of that section of the asset referred to. This does not need to include the asset number, as this is identified by the folder name.
6. File names should be kept as brief as possible commensurate with intelligibility
7. File names should not contain spaces, but may utilise the underscore (_) to aid comprehension. (e.g. layers_comp.doc could identify the Layer’s compartment)
8. Files should be stored in Word format, with the .doc extension.
9. An index of files may be kept to allow additional information.

Photographs
1. Photographs of the asset or its sub parts should be named identically with the corresponding survey or sub survey, with the addition of a suffix number separated by a hyphen (-) to differentiate different photographs relating to the same survey.
2. The suffix should be in the format nnn, with leading zeros where appropriate (e.g. layers_comp-001.tif)
3. Photographs should be stored in the Photographs sub-directory in TIFF format with a .tif extension.
4. Relevant photographs will be referenced in the appropriate survey. An index of photographs may be included.

Drawings
1. Drawings will follow the same naming convention as photographs.
2. Files will be stored in the drawing sub directory in PDF format for scans of hand drawn sketches. Sketches produced using CAD software should be saved in PDF format.
3. Drawings will be referenced in the relevant survey.
4. An index of drawings may be compiled.
ANNEXE D - Generic Work Instructions for Deck Coverings

GENERIC WORK INSTRUCTIONS FOR DECK COVERINGS

CONSERVATION
If there is not a conservation file already, report to the Conservation Manager who will create one.

Fill out Initial Conservation Assessment Survey form and return to the Conservation Manager, who will create a schedule of works.

Record details of general condition of deck, include photographs. Record size and materials, where tiles are used. Pay particular attention to the various finishes underneath. Take coating samples when they may be of archaeological interest and record in the asset conservation file.

Check what the approved finish was from the 1959 drawings Nos. AD001 – AD005.

Agree new finish to be applied with the Conservation Manager.

Note any unfinished areas which may have had fittings removed.

PREPARATION
Remove old deck coverings including the screed.
Remove all signs of corrosion and treat with corrosion inhibitor.

Ensure all edges of the area to be covered have something to butt against. Weld down 6mm mild steel edging strips where required.

Paint in bare steel edges and dadoes, refer to conservation paint scheme.

Note any evidence that fittings have been removed in the past. Pass list to the Conservation Manager.

LAYING PVC TILES and SHEET LINO
Apply screed primer and allow to dry.
Lay screed and allow to set thoroughly.
Lay tiles or lino using manufacturer’s approved bonding.

RECORDING.
Report all work carried out to the Conservation Manager so that works can be recorded in the asset conservation file.
ANNEXE E - Generic Work Instructions for Painting

GENERIC WORK INSTRUCTIONS FOR PAINTING

CONSERVATION
If there is not a conservation file already, report to the Conservation Manager who will create one.
Fill out initial Conservation Assessment Survey form and return to the Conservation Manager, who will create a schedule of works.
Record details of general condition, paint scheme, fixtures and fittings; include photographs. Pay particular attention to the various finishes underneath. Take paint samples when they may be of archaeological interest and record in asset conservation file.
Note any unpainted areas which may have had fittings removed. Note underlying paint schemes.

PREPARATION
Prepare compartment for painting.
Dust and wash down all surfaces, dry thoroughly. Lightly rub down surfaces with fine sandpaper or wire wool to key existing coats.
Remove flaky and cracked paint then feather off the edges.
Remove all traces of paint from woodwork.
Carefully identify all systems running through the compartment. These will need to be repainted in the correct ABC colours.
Ensure all signs, tallies, gauges and other small fittings are recorded prior to removal; remove same.
Report any defects found so that they can be repaired prior to painting.
Note any evidence that fittings have been removed in the past. Pass list to the Conservation Manager.

PAINTING
Remove all corrosion and treat with approved holding primer.
Paint compartment in accordance with Scheme of painting (held by Conservation Manager).
Tallies, glass indicators etc are not to be painted.
Replace all fittings removed prior to painting.

RECORDING
Report all work carried out to the Conservation Manager so that works can be recorded in the asset conservation file.
ANNEXE F - Conservation Projects Planned and In Hand

Conservation Projects Planned and In Hand

The Forward Superstructure

The forward superstructure is to be restored back to the 1959 configuration, to show how the area looked and worked at the end of the modernisation refit. It will also depict how the area was used during the final few years of the ship’s operational life.

The superstructure comprises the following areas:

- Signal Deck
- Gun Direction Platform
- Compass Platform
- Operations Room
- Admiral’s Bridge
- Captain’s Sea Cabin
- Admiral’s Sea Cabin
- Admirals Staff Planning Office
- Radar Maintenance Room
- Bridge Wireless Office
- Main Signal Office
- Electronic Warfare Office.

Restoration has begun in some areas.

Other Projects

- Restoration of P1 Close Range Blind Fire Director
- Restoration of S1 Four Inch Gun Mount.
Appendix 3

Interview Transcript - Andy Curran, Conservation and Facilities Manager, HMS Belfast, Imperial War Museums, 18/07/2013, HMS Belfast, London (43:23)

AF: OK. So, to start with, if you wouldn’t mind describing what your role is here?

AC: Right. I’ve got two roles here. One is the Conservation Manager, which broadly entails looking after the ship and presenting it as a museum piece, and the other one is the Facilities Manager, which is looking after the safety side of the ship, including the systems, and meeting all the legislation concerned with them.

AF: OK. So, what kind of things were in place when you took over the role?

AC: It was broadly run along the lines of a naval ship. There was no maintenance system in place, it was basically repair as things broke. There was a small crew of six technicians who looked after all of the systems and the structure itself and basically they kept the visitor route open and safe.

AF: OK. So, since you’ve been here it sounds like a lot of things have changed. What kinds of things have changed?

AC: Well, firstly we, we put a management system in place to ensure that, or to try and get ahead of all the breakdowns so that things were maintained in a… in reasonable time to prevent breakdown. We split the maintenance away from the conservation side and started looking at how we could keep the various bits of the ship that weren’t safety dependent maintained the same as the rest of the ship. Up to that point most of the upper deck fittings, for instance, had been just ignored.

AF: OK. So, have you taken a more, kind of, museum approach to the ship?

AC: Yeah. What we did was split the conservation so that anything with a heritage value was treated as a conservation project, in that we meticulously recorded all of the work that had been carried out on various parts of the ship and its fittings. Where there wasn’t a heritage issue - i.e. where compartments had been stripped out or machinery had been put in, for instance modern electrical systems, sewage systems, LP air to power tools - were broken off and they were straight maintenance. And then we built up a team of volunteers to concentrate on the conservation side to ensure that all the, all of the ship was looked after in one of those two groups.

AF: So, the museum has a conservation division for its other branches and objects. How much involvement have they had, or do they have now here?

AC: Very little. We’ve got a few exhibitions which have got items on loan or that belong to the museum and they are looked after by the Collections department. The ship itself – all the fixtures, fittings, the internals, the hull itself – are looked after by the ship with virtually no input from anybody else at all.

AF: So there’s a completely different attitude towards it even though it is just one object to the museum?
AC: Yeah, the ship’s treated as a single object, but what we’ve done here is to break it down into manageable components that we can work on, restore, conserve and look after and present to the public, or to our visitors. The... The ship as a whole, which is the actual artefact, is just unmanageable in its size, but it’s treated as a single entity by the museum itself.

AF: So, what level of detail does your documentation go to to counteract that?

AC: Well, as I say, we’ve broken the ship down to various components. So all the compartments are treated as their own, as their own entity. All the fixtures and fittings are their own. When we’re doing conservation work on here we actually go down to component level and record any work that we’ve done, anything that we’ve found, things that we’ve had to change because we haven’t been able to source them and back that up with lots of photographs to show the work that’s been done.

AF: Was that level of documentation there before you started, or has that developed?

AC: There was nothing at all, either on the maintenance or the conservation side. This has all been happening over the last five years.

AF: What brought you to the decision to start work on that?

AC: Well, firstly was to set up a maintenance system and actually get the ship under control from repairs, keeping it safe and meeting legislation and the conservation aspect was a spin-off of that, where we actually started looking round and surveying the, mainly upper deck fittings to start with, to make sure that we could preserve them for the future.

AF: So, how did you develop your Conservation Policy?

AC: Started off by looking at the ship itself and deciding how to break it down, how to actually identify components for the maintenance system. And then started looking at what work needed doing to make sure these things didn’t just disintegrate into a pile of rust. The actual recording of, of what we did was a spin-off of looking at various other museums and how they handled objects, and also how the Historic Naval Fleet managed their work and the Conservation Policy, which I first wrote in 2006, was an amalgamation of various sources.

AF: OK. What kinds of sources? Just museums and the Navy, or...

AC: It was mostly museums, but the Historic Naval Ships Association had, had quite a lot. The National Historic Ships had quite a lot of information, and that was more on the ethical side. As for material repairs, a lot of that was taken from experience of marine engineers, shipwrights, and other professionals on the staff.

AF: So, you mentioned the ethical side, what is the aim of you policy? What...

AC: Well, the main aim...

AF: What are you trying to achieve?

AC: The main aim is to actually present the ship as it would have looked when it came out of its modernisation refit in 1959. We have quite a bit of documentation in the form of drawings,
photographs and books from this period. The photographs are a really good guide to actually showing how the ship looked when it, during, the last sort of five years of its operational life. And that’s the, that’s the period in time that we’ve chosen to present it. It has a fantastic history, but of course the modernisation refit actually changed the form of the ship, so we present the physical ship as it would have looked in… from 1959-64, but still keeping its, its history from 1938.

AF: So does that mean that you work with the exhibitions team on the interpretation of that?

AC: Yes, we’ve been working with the interpretation side, so when we start a project where we actually doing a fair bit of rebuilding and replacing, we actually work very closely to ensure that everybody’s happy with what we’re doing, that we’re all in agreement with the programme for the project and that we can present the ship and interpret it, well, present parts of the ship and interpret them so that it meets everybody’s requirements. And of course the other part of the, that comes into this is the learning department who use quite a few examples of work we’ve done.

AF: What about the hospitality side? Does your policy cover anything to do with those spaces?

AC: Yes. For the most part the actual hospitality areas are not part of the heritage part of the ship. In fact, at some point in its time as a museum, whether it was owned by the… when it was owned by the HMS Belfast Trust, they’d actually stripped out several compartments to create quite large spaces for holding, holding functions. The exception to this is the Ward Room and the Admiral’s Quarters. These were literally decorated in the mid ’80s and were looking pretty tired and out of date, but, so when we redec… decided to redecorate – and we were given a grant from a catering firm who operate these spaces – we decided to go down the restoration route. We pulled out drawings, photographs, and all the documentation we could find from the 1959 period and actually restored those compartments back to their original configuration.

AF: So, does your policy take into account the hospitality, and the fact that it’s open to the public?

AC: Yes it… Yes it does. The visitor route goes through quite a large part of the ship and the function rooms are actually spread over four, five large areas, so the visitors are sort of guided around them. The… The actual…So… So the… Yep. The visitor route goes right through the ship. The actual, actual hospitality spaces themselves, two of them… [long pause]

AF: So, obviously you’ve got visitors around, and hospitality spaces, how does your policy treat the areas that there are visitors in and that there aren’t? Are they different?

AC: Yes, although when we’re… I mean obviously the visitor route is what, is what we concentrate on, and we’re opening bits up all the, all the time, again, restoring them to this 1959-60 period. The sort of back of house areas off the visitor route, we don’t concentrate on so much and we tend to just keep them safe and as rust free as possible, which is one of the biggest problems. The… We haven’t actually done a lot off the visitor route since I’ve been here. There’s a few compartments where we’ve had to do remedial works where corrosion has become so bad that it’s likely to escalate into a huge problem, but again, it’s, it’s the actual
visitor route that we’re concentrating on. The whole ship gets inspected over the course of a year – every single compartment – to make sure that we, we haven’t got any major issues coming up.

AF: So, what kinds of issues do you face?

AC: Well, corrosion is the, is the biggest problem that we have from the safety side. And of the course, the, the worst scenario is that the actual hull develops leaks and that, that compartments flood. Don’t have a huge problem with worrying about the ship, worrying about the ship sinking, but obviously you can get a lot of damage done in flooded compartments below the waterline.

AF: What other possible problems are there, and how would you go about identifying what could be a problem in the future?

AC: Well, again, we do carry out surveys throughout the ship on a regular basis. As I say, corrosion in the main problem. One of the other problems that we have is the amount of asbestos on the ship and that if there is damage to the actual lagging itself then we literally have to close the compartment until we can professional contractors in to sort it out for us. Of course, the expense of this makes it quite a, quite a major undertaking.

AF: So, is funding something affects your work?

AC: Yeah, as with every museum, we’re working to quite tight budgets, and of course, they’re being reduced year on year at the moment, so a lot of the projects that we have planned in the long term are likely to be deferred unless we can get backing from corporate sponsors.

AF: How does that affect the condition of the ship?

AC: It’s, to be honest, at the moment it’s not a huge problem, but over the longer term, over the next 25-30 years it could well be. Again, a lot of sponsors are quite happy to take, take on large projects in the public eye, but really, are not going to put up any money to, say, have a compartment well below the waterline, well off any visitor routes, to be restored in itself.

AF: Have you got an example of a big project like that?

AC: At the moment we’ve got a couple of spaces that are shut off, awaiting funding - which will have to be found from in the museum itself - to get some asbestos stabilised. At the moment, the whole place is actually hermetically sealed, so we can’t get in there at the moment, nor to any compartments below there.

AF: What about big projects that have been completed recently?

AC: Well, we’ve been… We’ve identified, well, a few years ago we identified some problems with the, with the masts. Some of the contacts that the museum has, or the ship in particular has, had dealings in Russia and approached several firms asking them for sponsorship to actually repair them. This is mainly the main mast, but the foremast to some extent as well. Several companies showed an interest over a few years and dropped out one by one, to the point where the main mast was looking so worrying that we decided to cut it down to the level of the funnel and actually leave it until we could find sponsorship to have a new part made.
Out of the blue we had a firm, a Russian firm from St Petersburg, offer to build us a new mast and replace it in its entirety. They came, their engineers came over to the ship, had a look at it, we produced all the drawing and documentation we could find from the, from the refit when these were first put up, and they agreed to build us a new main mast. As they were leaving, they also looked up and said they would build us a new foremast as well. And later in the year we had an email saying the masts were ready in St Petersburg, could they come and fit them? And this was actually carried out three years ago. In October 2010 we actually fitted two new masts. All of the fittings on them were taken off, restored and put back onto the new masts.

AF: That’s a big job then!

AC: Quite a big job!

AF: [Laughs] So, aside from getting big companies in to come and fix the big jobs, how do you, on a more day to day basis, go about solving the issues that you mentioned before?

AC: OK, we’ve got a string of projects lined up. We’ve been doing some restoration jobs on upperdeck fittings, such as Bofor… Bofor mounts, 4-inch guns, gun directors, and we’ve got a good idea of what work’s involved, what we’re likely to find and how much it’s going to cost, how long it’s going to take. So we’re actually able to plan a bit better for the next five years and taking on some of this work. We, year by year, put in a bid for funding through the museum for the, for the jobs that we have over the coming years.

AF: What kind of constraints are there on your plans? Apart from money…

AC: Well, the main one is, is actually not knowing what our workforce is going to be. The technical team - the permanent, professional team – are actually kept going full time just keeping the ship safe, keeping the structure safe and making repairs as necessary. But all of the fixtures and fitting, predominantly the ones on the upper deck, and some of the restoration jobs we’ve done inside the ship have been carried out by volunteers. The problem with volunteers is that they come and go, tend to work for fairly short lengths of time – under a year in some cases – though we do have some longer term ones. It’s actually very difficult to plan on an unknown workforce.

AF: How about the skill level? Is that a problem?

AC: It’s… What I’ve done is, written into the policy that we would do training. So, as volunteers come in we tend to exploit the skills they already have and try to give them some basic instruction on, on skills that they don’t have. The main thing is that everybody’s working safe and knowing their limitations so they don't actually take on something that could cause more problems than it solves.

AF: What about the weather? Obviously lots of the ship’s outside.

AC: Yep. What we tend to is for nine months of the year we work on the outside of the ship, which is where most of the corrosion problems lie, and for the sort of winter months, move inside the ship restoring internal compartments. So far we’ve been mainly concentrating on the forward superstructure where we have a, quite a detailed long term plan to bring it back to that 1959 configuration and work everything, everything around a specific point in time.
AF: So, how does being outside affect the condition?

AC: Well, the whole of the upper deck’s open. Open to the, the wind and rain. We have slightly different problems between the port and starboard sides of the ship in that the starboard side is almost permanently in the shade so we tend to get more corrosion problems than we do on the sunny side. Obviously there’s days where we literally can’t work through, whether it’s because of wind or rain, and we have fallback jobs inside the ship to make sure everybody’s got something to do, and something interesting to do.

AF: So, I guess if you’ve got two different side of the ship, does that mean that you can’t regulate any of the conditions inside for the compartments that don’t get affected by the elements?

AC: We have some ventilation systems, which keeps a fairly stable atmosphere in the inside of the ship, but we have very little control over temperatures. In the winter we tend to get a lot of condensation, in the summer it tends to be very hot and humid in… inside.

AF: So that’s not ideal for a museum object?

AC: Absolutely not!

AF: [Laughs] So, aside from the weather, how do visitors change the work that you do?

AC: Obviously the busiest time for visitor numbers – when we’re looking at about 2000 people a day coming through the ship – is during the school summer holidays and we tend to try and scale down the space we’re taking up on our, our restoration jobs on the upper deck to make sure that as much of the deck is open as possible. In the winter we tend to have very few visitors and we take the opportunity to do some of the work that we cannot do with a heavy footfall. Things like, repairing decks and deck coverings, whether it be paint, tiles, carpet or whatever.

AF: How do visitors… Does the behaviour of visitors affect the condition of anything? You know, touching, that kind of thing…

AC: Absolutely. We’ve noticed that, especially our younger visitors, really like anything that moves so we try and make sure that people really can’t get to things which are fragile and this is mainly so, in places like the Bridges and the Radio Rooms where there’s a lot of equipment, with a lot of knobs on them, which can be easily broken. So what we’ve had to do is to start screening using clear acrylic, screening off the bits of equipment themselves to protect them.

AF: So, it sounds like in the past when you didn’t have that, did you get a lot of damage?

AC: Yeah, there’s quite a few, quite a few things around the ship that, that have been damaged. Not by any… probably not in any malicious way, but just the fact that things are a little bit fragile for, for the enthusiastic younger visitors generally. There’s a couple of times where we, we’ve actually locked things away behind gates, purely because we’re worried that bits could be taken or even have bits stolen from us.

AF: So, what do you do in those situations, where something’s been damaged? How do you… do you replace the parts?
AC: Right, well, not always. In some cases we simply leave them and then we have to look at whether it looks odd, then, and then it comes down to the interpretation of the space. If… if a part that’s missing means that you really can’t understand what something is or how it worked, then we’d probably replace it with a replica, and we’ve done that in… In one of the 4-inch gun mounts, and all of the bits we had made for that mount we stamped with an ‘R’ for replica. Where we can we always use the original materials, or leave them as they are, but unless it looks really odd, then we will put replica parts on, just to make sure it’s easy to understand how something worked.

AF: So… so you were talking about using replica parts for things. When I’ve been speaking to your technicians, they tell me that you’ve got lots of original, sort of, spares for things as well?

AC: Yeah, a lot of things were actually taken off the ship, mainly to create easier walkways for visitors and down in the magazines and deep stores we started finding some equipment, and after a bit of investigation, found out where they belonged and actually started putting them back. An example of this is the Admiral’s Bridge which had been completely stripped out and we actually found quite a few of the original fittings had been taken off, because they got in the way of the, of the visitor route. Not to any great extent I thought, and actually, I took these bits out and actually mounted them where they should be. Also we had some furniture made for us to go in, go in there and again that was a modern fit, but absolute replicas of what was there before. A few of the common items – things like sound-powered telephones – we’ve got quite a few extra on the ship that have come out of compartments that have been stripped out for financial reasons, i.e. the café, so we’ve got quite a few items stuck around the ship that are basically spares and we can use, use these to replace any damaged items that we find.

AF: How do you feel that affects the, kind of, integrity of the ship as a whole? Do you…

AC: I think it works well. Two… Two… Two aspects. One that you can see exactly what should have been where and why they were, why they were different types of communication systems, for instance, through the ship. The other is that, with partial bits of equipment dotted around, it gives the ship an uncared for look and that reflects in some of the letters we get from visitors, pointing out, or asking why things are in bits or why things aren’t whole. So there’s a sort of delicate balance between the sort of ethical aspect of keeping the ship exactly as it stood when the museum got hold of it, to actually presenting it as a… as a museum piece so that it can be interpreted for what it was when it was operational.

AF: So the visitors are obviously very important in the way that you approach the work, what have you had to change to accommodate them?

AC: Right, as a warship, very little concern would have been taken for access. It was designed as a warship to be manned by pretty fit young men who could move heavy equipment about; access places through vertical ladders and quite small openings. Obviously our visitors range in age from toddlers to quite elderly people, who might not be as agile as young sailors, so what we've done is replace some of the vertical ladders with normal steps with as shallow a rake on them as we can get, bearing in mind we haven’t cut much of the ship away to create access. In a couple of places we have cut bits out, where there have been high coamings, and
also to create a wheelchair accessible route through a fairly large part of the ship. Where we have cut things out, since I’ve been here, we’ve kept the pieces that we've removed and recorded them, along with photographs – what we’ve done, how we’ve taken it out – and we’ve bolted up the actual piece we took out very close to where it came from so that it, it could be put back to make the ship… back to… as the ship was built. And also, at some point the ship needs to a, for a docking and some of these access routes that we created will need to be put back to make the ship watertight for a tow.

AF: So, most of the work that you do is reversible?

AC: Most of it. We certainly, certainly keep in mind that we, we would like to be able to put it back together if the need ever arose. We’re a museum, we’re going to stay a museum and I really can’t see that happening.

AF: Fair enough! So, how much contact do you have with other similar museums?

AC: We… As an organisation, or as a museum, we are part of the Historic Naval Ships Association and quite a few of our visitors who come here from that organisation, mainly in America, actually make themselves known to me and we exchange information, mainly through the website, but occasionally specific questions come from, from other ships, asking how we’ve gone about things, how we operate. We’ve been able to help quite a few in that respect.

AF: So, that sounds like there isn’t a great deal of, sort of, official framework about conservation in the same way that there are about other museum objects?

AC: No, there’s not. We actually share information, as I say, most of, most of the ships that, in the Historic Naval Ships Association are American and there’s a lot, actually a lot of common equipment on them, especially the electrics and electronics, navigation. So we actually pool information when we get hold of it. Most of the shipkeepers that I’ve talked to run slightly differently to here, and actually just keep a ship presentable. And I think this is the only one that’s gone down this conservation route, and certainly the only steel ship, warship, that’s gone down this conservation route that we have.

AF: In sort of looking at American ships, and indeed Japanese ones, I’ve come across that they kind of go for a memorial standpoint. Is that...

AC: No. The IWM policy has been to actively avoid becoming a, a memorial for sailors. Certainly the way we present things recognises the people who were involved and the sort of jobs they did, but we’ve, we’ve managed to avoid going down that route.

AF: So, what about the future, what plans have you got?

AC: Well, the future, at the moment, is a 25-year plan, which is coming together. We’re looking at docking sometime in 5-10 years time to actually check the underside of the underwater part of the ship. For the rest of it we've got a lot of equipment still on the upper deck to restore. There’s a five-year plan in place for that at the moment, or for those fittings at the moment. Things like gunnery, gun directors, navigation equipment, and replenishment at sea equipment to restore. And of course, all of the equipments that we have already restored,
we’ve put a maintenance system in place to make sure that we don't have to go back and start again at the end of it.

AF: So there’s no plans for keeping her in dry dock? Obviously there aren’t very many floating ships.

AC: No. The ideal environment for a ship is to actually be floating. It puts a lot less strain on it than docking. Even docking would cause a lot of problems, it certainly wouldn’t solve any of the corrosion problems. It might make it easier to access some of the, some of the ship that you can’t get to at the moment, due to having vertical ladders, very tight spaces, systems in place, but the ideal place for it to be is floating. And right in the centre of London where we get the maximum financial benefit from footfall.

AF: So, what’s the… what was the intended lifespan of the ship?

AC: Warships are generally about 30 years. This one was launched in 1938, so it’s well past its operational date. But given the fact that ships of this era were so heavily overly engineered, the, the corrosion of the hull, which I mentioned earlier, is probably not the same sort… is not as big a problem as it would be on a modern ship, which is designed to be just safe.

AF: Fair enough. Do you get any feedback on how the ship is doing, on its aims, and how it’s recognised?

AC: Yeah. Obviously we get about quarter of a million visitors through the ship each year and they’re asked to leave comments on their trip. With very, very few exceptions we have positive feedback on the way we’re presenting the ship and how interesting it is. From a professional point of view though, we’ve also been recognised by W.H. Allens Heritage, who were a major engineering supplier for the Royal Navy through most of the 20th Century, and their Heritage Association had a dinner on here and presented us with an award for looking after the kit that they were interested in. Similarly the Institute of Mechanical Engineers took the same approach, were very impressed with the way that we presented the ship and that we looked after it from an engineering point of view, and they also presented us with a Heritage Award. The volunteer teams who work very hard doing a lot of the restoration jobs on the equipment, or the fittings on the ship, have also been recognised by the London Museum Hub, which is, recognises the work that volunteers do in museums. Also, the National Historic Ships, which is the, sort of, the British organisation, recognised the volunteer teams for the work that they did, especially when we had an accident and the ship was inaccessible, or very difficult to access, for about six months. And individually, I won an award from the Historic Naval Ships Association for the setting up of this conservation system, policy, and maintenance system for the ship itself.

AF: That’s quite an impressive list of accolades! Just to go back, you mentioned the mechanical… Institute of Mechanical Engineers, I’m assuming they were interested in, kind of, the machinery of the ship?

AC: Yes, absolutely. In fact they, they… give an award out each year, and for the last few it’s been for large objects. One of the - I can’t remember which one - a railway engine restoration job was certainly the one before us. But that particular one was for the ship, and particularly the main machinery in it, which was their main interest.
AF: How much of the machinery is in working condition?

AC: None at all. The ship’s system was a direct current system and most of the machinery was actually electrically driven, with the exception of the main machinery and auxiliaries. The… to actually keep steam up on the ship would be incredibly expensive in manpower, money and… and shoreside resources, which possibly even don’t exist. So we certainly steer well clear of trying to get steam in any systems. The electrical system we actually have, our electrical supply comes over the gangway as normal town supply at 440V and there’s two rectifiers which keep some of the old DC systems going. The only things we’ve got running at the moment are a couple of ventilation fans and a few lighting circuits. My intention is to decommission these as soon as we possibly can. One, so that I can rid of the rectifiers, and secondly that the ship would be a lot safer if it only had the 240V system. Some of the old system could well be 75 years old now. Where we do get things moving and giving the impression of animation, we use manpower. So, where we’ve restored things we’ve been using the emergency back-up, which is handpower to actually make things like gun mounts move around; shell hoists to bring up ammunition from the magazines.
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