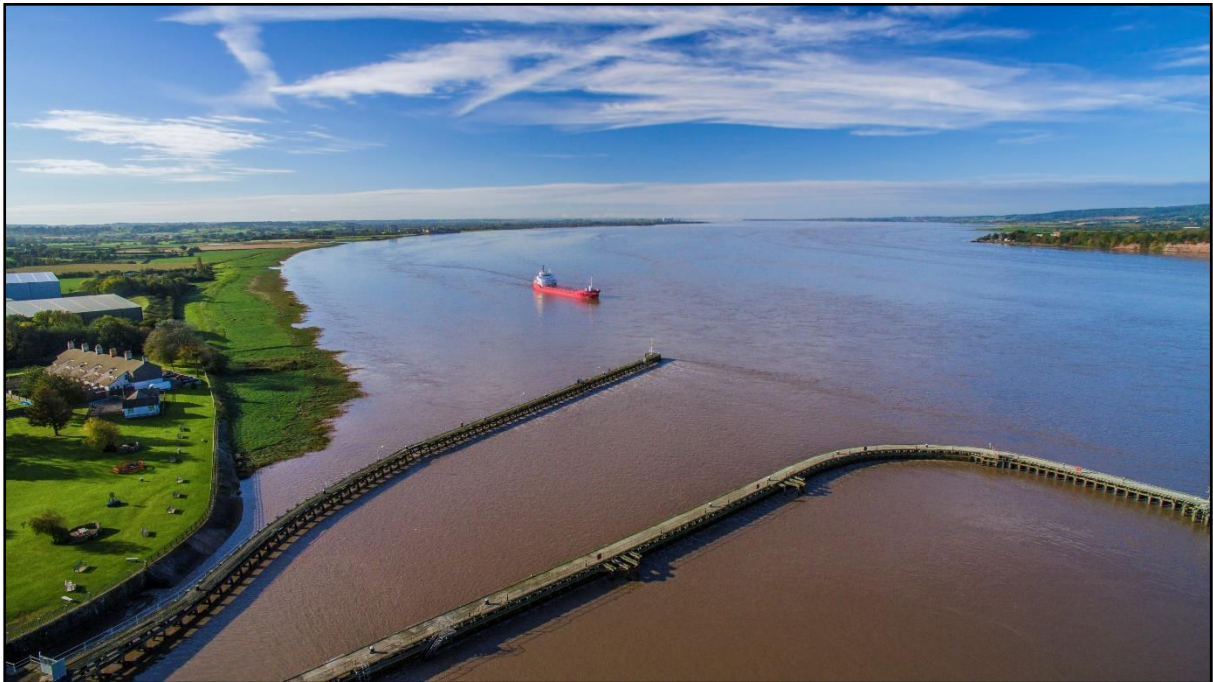




# SAFETY MANAGEMENT PLAN

Author: M Johnson  
Harbourmaster/Marine Officer



Gloucester Harbour Trustees' highest priority is safety and operates a Safety Management System (SMS) that complies with the UK Government's Port Marine Safety Code. This Safety Management Plan is the top level document in the SMS and states our Safety Policy, describes the GHT Operation, the relevant safety legislation and guidelines, how our organisation delivers safety, the SMS Documentation, the management of safety, hazards and risks, incident control and reporting, and our processes for continuous improvement in safety management.



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## Abbreviations

ALARP	As Low As Reasonably Practicable
CRT	Canal & River Trust
DWT	Deadweight tonnage
ECDIS	Electronic Chart Display and Information System
GHT	Gloucester Harbour Trustees
HAT	Highest astronomical tide
HSE	Health and Safety Executive
KPI	Key Performance Indicator
LAT	Lowest Astronomical Tide
MCA	Maritime and Coastguard Agency
MHWN	Mean High Water Neaps
MHWS	Mean High Water Springs
OPRC	International Convention on Oil Pollution Preparedness, Response and Co-operation
PMSC	Port Marine Safety Code
SAC	Special Area of Conservation
SMP	Safety Management Plan
SMS	Safety Management System
SSSI	Site of Special Scientific Interest
UKHO	UK Hydrographic Office

# 1. This Document

Gloucester Harbour Trustees (GHT) are accountable to its stakeholders and Government for the safe operation of the Gloucester Harbour (as defined in Section 3 of this document). GHT discharges this responsibility by maintaining a Safety Management System (SMS) that complies with the UK Government's Port Marine Safety Code (PMSC) (reference A), and takes into account the principles and guidance offered by the Health and Safety Executive's guidance document HSG65 'Managing for Health and Safety' (Reference F).

This Safety Management Plan (SMP) is the top level document in the GHT SMS.

The document states the Gloucester Harbour Trustees (GHT) Safety Policy (section 2). It describes the GHT area of responsibility and marine operations (section 3). The relevant safety legislation and guidelines are defined in section 4. The Safety Management System, including organisation, documentation, monitoring and audit are described in section 5.

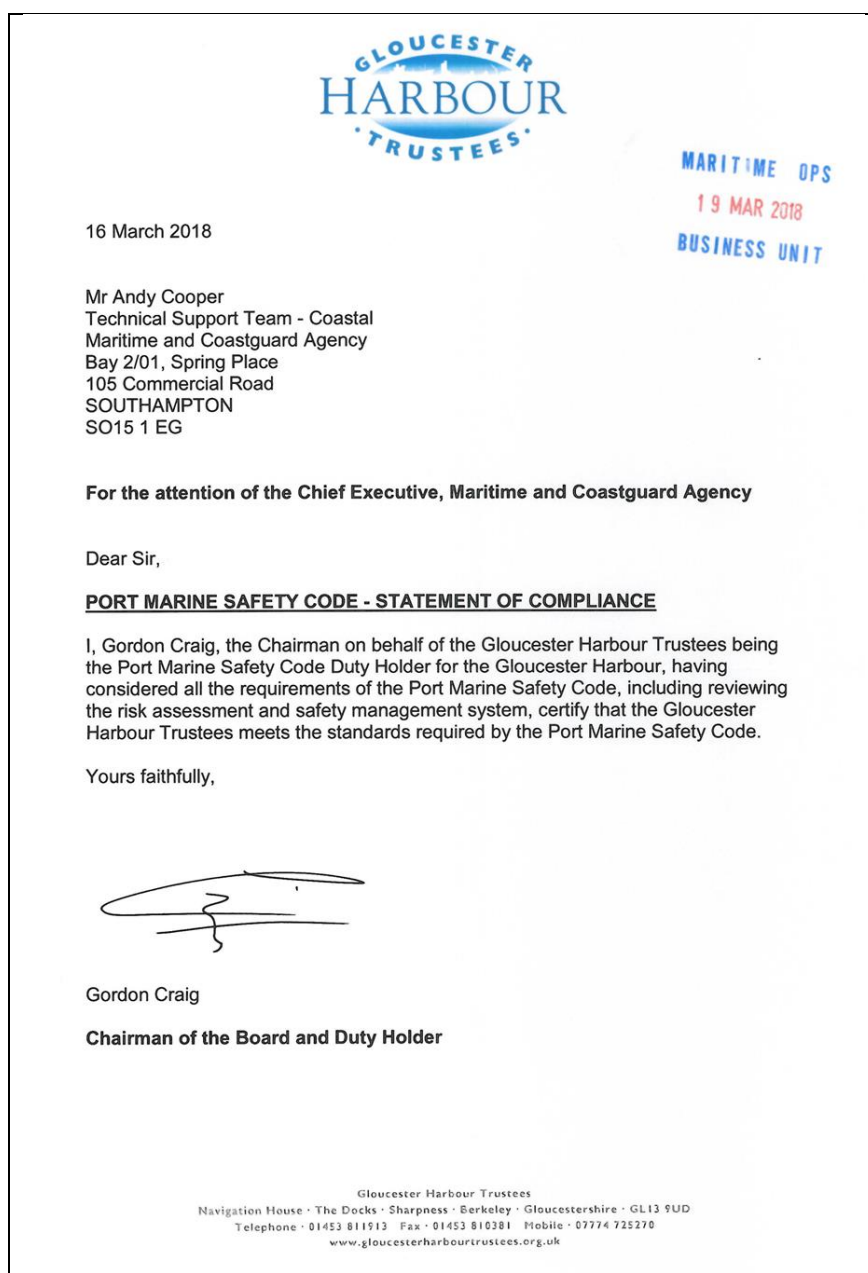
Section 6 discusses the safety risks involved in the operation of GHT and how they are managed. Incident control and reporting is covered in section 7, and our processes for continuous improvement in safety management, including review, audit, key performance indicators and how lessons learnt are acted upon are described in section 8. A set of Annexes provide the detailed plans and supplementary information that complete the documentation set of the SMS.

This plan and its Annexes are downloadable from the Gloucester Harbour Trustees website, [www.gloucesterharbourtrustees.org.uk](http://www.gloucesterharbourtrustees.org.uk)

## 2. The GHT Safety Policy

### 2.1 Safety is Our Highest Priority

GHT's highest priority is the safety of personnel and vessels, along with protection of the environment. GHT is committed to full compliance with all relevant health and safety legislation. The UK Government has published the Port Marine Safety Code (PMSC)<sup>1</sup> and associated Guide to Good Practice as the safety code for UK Harbour Authorities and Authorities responsible for other marine facilities, berths and terminals with statutory powers and duties. GHT complies with the PMSC and confirms this compliance in the required triennial letter to the Maritime and Coastguard Agency (MCA) reproduced below.



<sup>1</sup> Issued jointly by the Department for Transport and Maritime and Coastguard Agency  
Document Ref GHT 6, Issue 17 dated 31 January 2019



## 2.2 Key Policies for the Management of Safety

- GHT shall have a Safety Management System that complies with the requirements of the Port Marine Safety Code
- Matters of health and safety shall never be overridden by other priorities.
- GHT shall assess the safety hazards and risks to everyone who may be affected by activities under its control with the aim of reducing risk to a level, which is As Low As Reasonably Practicable (ALARP).
- In accordance with the PMSC, GHT shall appoint a “Designated Person” to be responsible for reporting annually on compliance of the SMS with the PMSC and day-to-day adherence to the SMS.
- The provisions of the GHT SMS shall apply to GHT employees, contractors and any other third party operating within the Harbour area engaged in activities over which GHT has jurisdiction.
- GHT employees shall be adequately trained and instructed and provided with suitable equipment to conduct their activities in a safe manner. Contract staff are required to work to the same standards.
- Incidents or Near Misses shall be promptly reported and acted upon to ensure that lessons are learnt by way of improving procedures, training, etc.
- GHT shall continue to develop policies and procedures in response to changing trends in traffic and operations to ensure exposure to risk by harbour users remains ALARP.
- GHT shall publish the up to date documentation comprising the Safety Management System, together with performance against a set of safety Key Performance Indicators (KPIs)<sup>2</sup> via its web site.

## 2.3 The Port Marine Safety Code and GHT’s Safety Management System

2.3.1 Following the grounding of the Sea Empress at Milford Haven in 1996, UK Government initiated a Review of the Pilotage Act 1987 which led to the issue of the Port Marine Safety Code (PMSC) in March 2000. The aim of the PMSC is to help Harbour Authorities to demonstrate achievement of nationally agreed standards for safe marine operations within their waters. It sets down a standard to which they are required to hold themselves accountable publicly.

2.3.2 To demonstrate compliance with the PMSC, and in the interests of transparency, each Harbour Authority must produce a periodic statement setting out the policy it has adopted for

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<sup>2</sup> Performance against KPIs will be published in the GHT Annual Report Document Ref GHT 6, Issue 17 dated 31 January 2019

discharging its duty to ensure that marine operations in the harbour and its approaches are properly regulated; and reporting on the effectiveness of that policy and associated systems and procedures.

2.3.3 All Harbour Authorities are required to develop policies and procedures in accordance with the PMSC and publish the policies and procedures they have adopted to achieve the required standard. Harbour Authorities are also required to publish amendments to their plans and to publish reports of their formal periodic reviews, setting performance against their plans and against the standards set in the PMSC. Reports should be at not less than three-yearly intervals: additional reports may also be appropriate.

2.3.4 A Harbour Authority's policies and procedures should include a statement of policy committing the Authority to undertake and regulate marine operations in a way that safeguards the harbour, its users, the public and the environment.

2.3.5 Harbour Authorities are required to develop a safety policy for marine operations within their jurisdiction. This requirement itself makes a contribution to safety by obliging those responsible to consider its importance, and the need for practical and formal safety systems. The policy should be published, both to demonstrate the Authority's commitment to the policy and also to ensure the involvement of harbour users. The management of any harbour under statutory powers should be based on a clear safety policy adopted by the harbour authority. Harbour authorities should make the following commitments:

- to undertake and regulate marine operations in a way that safeguards the harbour, its users, the public and the environment;
- to manage the relevant assets of the authority safely and efficiently;
- to discharge the duties and powers described in the PMSC;
- to maintain relevant harbour equipment to agreed industry standards;
- to recruit and train operational staff to nationally agreed competence levels;
- to ensure that staff are properly trained for emergencies and contingencies.

2.3.6 GHT formally announced its completion of the implementation of the PMSC in December 2001.

2.3.7 GHT is resolved to meet the commitments required by the PMSC and to that end has developed a documentation set that comprises its PMSC-compliant SMS. Details of these documents are provided in this SMP. GHT has consulted with users of the Gloucester Harbour and other stakeholders in developing the SMS documentation. Copies are readily available on GHT's website at [www.gloucesterharbourtrustees.org.uk](http://www.gloucesterharbourtrustees.org.uk). Copies are also available from the Trustees' office on request.

2.3.8 GHT is committed to reviewing its policies, procedures and local legislation at regular intervals, in line with the requirements of the PMSC, to ensure that they remain current and effective. It also has in place a system for reporting any accidents, incidents or near-misses involving safety which will

also trigger a review of the relevant policies and practices of GHT. The 'Designated Person' appointed by GHT provides an annual audit of its documentation and procedures.

## 2.4 Safety Management Plan Revision and Formal Endorsement

This Safety Management Plan has been formally endorsed by the Gloucester Harbour Trustees.

<i>Review and Revision Record</i>	
First Published:	31 December 2001
Reviewed and Revised:	2003, 2006, 2007, 2008, 2011, 2013, 2014, 2015 (Feb), 2015 (Nov), 2016 (Jan), 2016 (Aug), 2017 (Mar), 2018 (Aug), 2019 (Jan).

This Revision, issue 17, January 2019, follows complete review of the document and annexes following internal audit and recommendations by the Designated Person.

### 3. The Gloucester Harbour

#### 3.1 Description of the Harbour

##### 3.1.1 Geography and Environment

The limits of the Gloucester Harbour are prescribed by Article 11 of the Gloucester Harbour Revision (Constitution) Order 2002.

The Gloucester Harbour includes the estuarial waters of the River Severn upstream of a line joining Goldcliff on the Welsh shore, Denny Island and a point south of Severn Beach on the English shore to Llanthony and Maisemore Weirs at Gloucester and the River Wye downstream of Bigsweir Bridge. This involves some 50 nautical miles of tidal waters. Figure 1 refers.

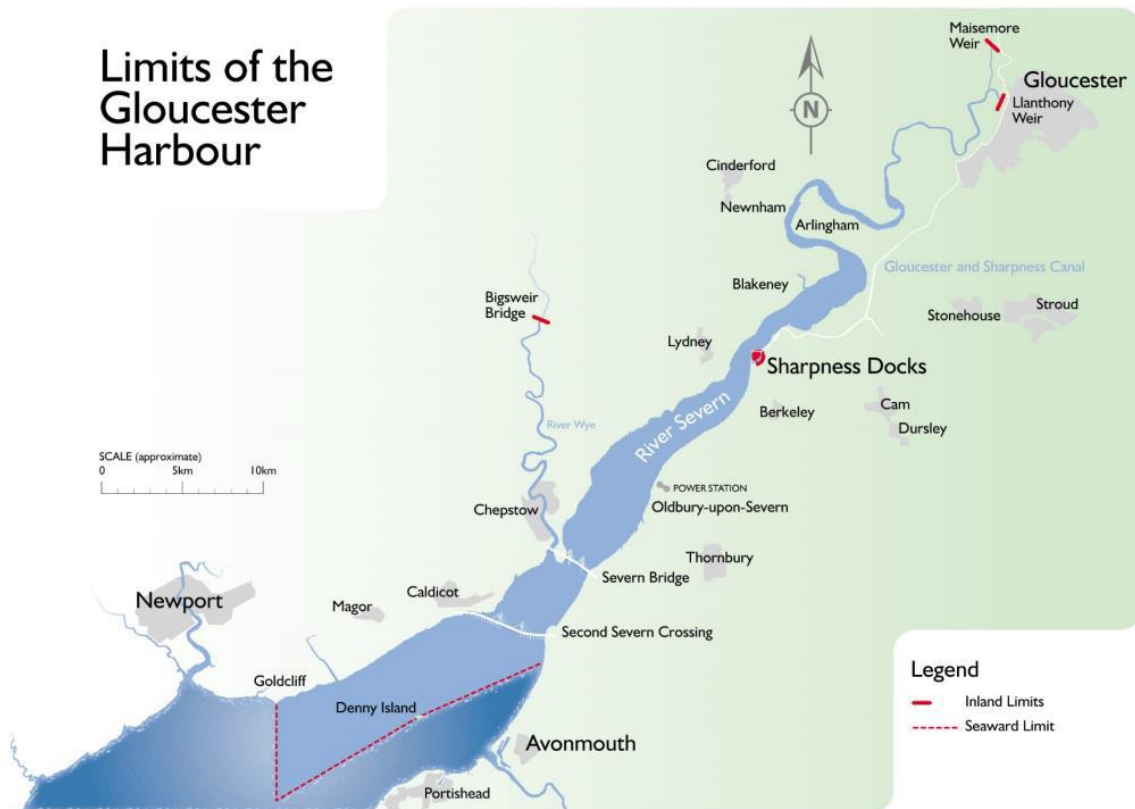


Figure 1 – Definition of Gloucester Harbour

These waters are part of a large estuary system formed following marine inundation of a former river valley system. Tidally generated and maintained sandbanks over which there are continually changing depths are found within the shallow waters. The bed of the narrow navigable channel is of hard consolidated sand with occasional rock outcrops.

The Severn Estuary has one of the largest tidal ranges in the world, with currents of up to 8 knots being noted in certain locations and conditions. In general, the high tidal velocities inhibit

permanent deposition over most of the estuary. Maintenance dredging within the harbour has not been required, although levelling of the rock bed in one section of the harbour was carried out in the past.

The effects of the Severn Bore, which occurs regularly, are experienced between Sharpness and Gloucester.

The tides in the Gloucester Harbour are uniformly diurnal, with a mean range of 7.2m at Sharpness and 9.6m at Beachley. The area has an annual average temperature of 10°C. Periods of fog and mist which significantly affect visibility are usually temporary, affecting an average of 12 days annually. South-westerly winds prevail with an average strength of 12 knots. Ice does not affect navigation within the Gloucester Harbour.

### 3.1.2 Aids to Navigation

GHT maintains a comprehensive system of aids to navigation, comprising day marks, buoys, lights and radar surveillance (Annex I).

### 3.1.3 Bridges

The River Severn is crossed by two major road bridges. The Second Severn Crossing (M4) and Severn Bridge (M48) have, respectively, 35m and 34m vertical clearance above Highest Astronomical Tide (HAT).

Close to Beachley Point, the River Wye is crossed by the Wye Bridge (M48), having a vertical clearance of 13m above HAT. At Chepstow and beyond, several further road and rail bridges cross the river, but limited vertical clearance restricts the type of craft which may navigate to small leisure craft.

### 3.1.4 Overhead Cables

**Power Cables:** An overhead power cable with a safe vertical clearance (as defined by the responsible authority) of 39m above HAT crosses the River Severn between Beachley Point and Aust Cliff. The same cable crosses the River Wye with a safe vertical clearance of 16m. Between Beachley Point and Chepstow, the River Wye is spanned by two further overhead cables, the safe vertical clearance being 32m above HAT. The River Severn above Sharpness is spanned by two further overhead cables, the safe vertical clearance being 19m above HAT. St Pierre Pill is spanned by a power cable having a safe vertical clearance of 7.3m.

**Telephone Cables:** An overhead telephone cable with a safe vertical clearance (as measured) of 5m above HAT crosses the River Severn between Minsterworth stone chute and Elmore Back.

### 3.1.5 Anchorages

There are no formally-designated anchorages within the harbour.

### 3.1.6 Special Environmental Sensitivities

Included within the area of the Gloucester Harbour are the Severn Estuary Site of Special Scientific Interest (SSSI), the Upper Severn SSSI, River Wye (Lower Wye) SSSI, a “Ramsar Site” (i.e. a wetland site designated to be of international importance) and Special Protection Area (SPA) (EU Directive on the Conservation of Wild Birds). The harbour also falls within the Severn Estuary Special Area of Conservation (SAC) and includes the River Wye SAC.

## **3.2 Harbour Operation and Marine Services Provided by GHT**

### 3.2.1 Harbour Users

The current commercial traffic comprises bulk carriers engaged in the European coastal trade having an average size of 3,600 DWT. Drafts of vessels bound to/from Sharpness Dock are limited to a maximum of 6.55 metres, and most vessels are presently less than 6 metres. The least depths within the marked navigation channel are between 5.6m (MHWN) and 9.3m (MHWS).

The products moved commercially within the Gloucester Harbour consist mostly of dry bulk cargo, including cement, scrap, cereals, fertiliser and feedstuffs. There is no movement of crude oil or petroleum products. With the exception of a small local trade in dredged sand, all cargoes are moved through the port of Sharpness.

Other users include recreational craft based at several sailing clubs on the estuary. Motor cruisers and canal craft regularly transit the area to/from the inland canal network.

### 3.2.2 Traffic Patterns

The traffic in the harbour is two-way day and night with no vessel traffic control. Movements are limited by the tidal regime to a window of approximately 3 hours on each tide. Pilotage is compulsory for the majority of commercial vessels using the harbour. The marked channel is formally designated a narrow channel, requiring all vessels to heed the appropriate rules concerning collision avoidance. Unless exceptional circumstances dictate, commercial vessels do not deviate from the marked channel. To avoid conflict, vessels departing Sharpness generally do so prior to the arrival of inbound traffic. Vessel movements are timed to avoid passing or grouping of vessels where the channel narrows.

### 3.2.3 Pilotage and Pilot Authorisation

Pilotage services for the Gloucester Harbour are provided in accordance with the provisions of the Pilotage Act 1987 under contract to GHT by the Gloucester Pilots’ Partnership. GHT recognises that the pilots play a pivotal role in the safe navigation of the harbour by commercial craft.

The Trustees keep under consideration what pilotage services need to be provided to secure the safety of ships navigating in or near the approach to the harbour, and the circumstances in which pilotage should be compulsory. If the pattern of use of the harbour changes, the Trustees will review the requirements of the pilotage service provided and implement any necessary changes.

Document Ref GHT 6, Issue 17 dated 31 January 2019

Manning levels are regularly reviewed to ensure that sufficient authorised pilots are available.

Pilot training and authorisation criteria are also regularly reviewed and are set out in the current Pilotage Directions (Annex B). Training requirements take the relevant National Occupational Standards into account. Generic Electronic Chart Display and Information System (ECDIS) training is undertaken by pilots as required.

#### 3.2.4 Embarkation and Disembarkation of Pilots

The boarding and landing of pilots is carried out in accordance with the provisions of statutory legislation and relevant Codes of Practice and with due regard to matters of health and safety. The current Code of Practice is set out in reference D.

#### 3.2.5 Towage and Tugs

The need for towage or tug assistance to a vessel is a matter for the Master to consider in conjunction with advice from the pilot and harbour/port authority. Under normal operational circumstances there is no specified requirement for such assistance. No tugs are provided by the Harbour Authority, but are available for use from commercial service providers if required. Only registered tugs and bona-fide tug operators will normally be permitted to undertake towage or tug services within the harbour. The occasional use of non-coded vessels for towage purposes will be subject to local risk assessment.

The Harbour Authority can require towage or tug assistance to be taken in any circumstance in the interests of port safety. Such a requirement may be imposed after an assessment of the particular circumstances with the pilot. Factors which may be taken into account include, but are not limited to, vessel draft, vessel defects/damage, vessel length, vessel manoeuvring characteristics, manoeuvring room available, pilot experience and reduction of risk.

Details are set out in Annex D: Towage Guidelines for the Gloucester Harbour.

#### 3.2.6 Interface with Canal & River Trust at Sharpness

The Canal & River Trust (CRT) manages the Port of Sharpness. The management of safety of vessels arriving at or departing from Sharpness Dock is undertaken by CRT for vessels east of a line between the seaward ends of the north and south piers at the entrance to Sharpness Dock (see figure 2). Similarly the safety of personnel within Sharpness Port falls under the jurisdiction of the CRT. CRT's Safety Management System for the Port of Sharpness (ref E) governs safety for the Port.



Figure 2 – The interface at Sharpness between the CRT SMS and the GHT SMS

Pilots are provided by GHT for vessels transiting the estuary defined as being inside Gloucester Harbour limits; GHT’s responsibility for pilotage finishes once a vessel is inside the Bellmouth east of the red line shown in figure 2.

CRT man Sharpness Radio from the Pier Head on VHF Channel 13 and provide advisory information relating to tide, weather and vessel movements to vessels making their approach, though it is noted that this is not a VTS service and information conveyed is provided only as assistance.

Vessels occasionally use a river berth by the Sharpness Old Dock which presents a GHT/CRT safety interface in that the vessel is in GHT waters with linesmen and shoreside support provided by CRT.

### 3.2.7 Hydrographic Survey

A full survey of the harbour was conducted in 2000 and repeated in detail during 2015. Low water inspections and monitoring of the channels and shoal areas are carried out monthly and the results distributed internally. Local Notices to Mariners are promulgated in the event of navigational hazards being identified.

Major surveys are required to be carried out in accordance with the Hydrographic Code of Practice, unless otherwise agreed with the UK Hydrographic Office (UKHO).

### 3.2.8 Information to Mariners

UKHO receives all hydrographic information and any Local Notices to Mariners promulgated by the Trustees. Chart BA1166 (River Severn – Avonmouth to Sharpness) (Reference C) is thereby kept up to date. Notices are published on the Trustees’ website.



### 3.2.9 Provision of Aids to Navigation

The harbour is marked by a comprehensive, well-maintained and modern system of navigation aids, the characteristics and availability of which comply with internationally agreed guidelines as set down by IALA.

Aids to navigation are maintained to a level consistent with the availability criteria laid down by the General Lighthouse Authority (Trinity House). Defect reporting and rectification notices are submitted to Trinity House using the on-line "PANAR" system. This system may be used to produce a variety of reports relating to the status of the Aids to Navigation.

### 3.2.10 Wrecks

There are currently no wrecks of any significance to navigation within the Gloucester Harbour. The Trustees will exercise their powers to deal appropriately with any wreck that is, or is likely to become, a danger to navigation.

### 3.2.11 Information on Prevailing Conditions

Harbour users can obtain weather forecasts from the usual official sources. GHT provides, through its web site, an automatic data source on prevailing meteorological and tidal conditions, though this information is an advisory rather than an official source of data.

### 3.2.12 Maintenance and Dredging Works

GHT undertakes all maintenance of the aids to navigation in the Harbour. The Trustees also control dredging works as required. Regulations and conditions for the issue and control of works and dredging licences is contained in the Gloucester Harbour Management Plan.

## **4. Safety Legislation and Guidelines**

### **4.1 Gloucester Harbour Trustees Status**

GHT is the statutory Harbour Authority for the Gloucester Harbour. GHT was constituted as such under the Pier and Harbour Orders (No. 3) Act 1890, which authorises the Trustees to exercise and perform the powers and duties of a Harbour Authority under the Harbours Docks and Piers Clauses Act 1847. GHT is also a competent Harbour Authority pursuant to the Pilotage Act 1987. Powers are defined in national and local legislation – see Appendix 5.

### **4.2 Byelaws**

The Gloucester Harbour Byelaws are based on practical experience and are intended to enhance the safety of navigation and protect the environment. They are subject to periodic review.

### **4.3 General Directions**

The Trustees have issued General Directions applicable to all vessels (Annex K).

### **4.4 Port Marine Safety Code**

The Safety Management System is based on HM Government's Port Marine Safety Code (reference A).

### **4.5 UK Government Safety Guidance**

The Safety Management System draws on HM Government's guidance documents "A Guide to Good Practice on Port Operations" issued by the MCA (ref B), and 'Managing for Health and Safety' issued by the HSE (ref F).

### **4.6 Passage Planning Requirements**

Vessels are required by law<sup>3</sup> to produce passage plans. Passage Planning requirements for Gloucester Harbour are provided in Annex A.

### **4.7 Pilotage Directions**

The Trustees have issued Pilotage Directions (Annex B). The Pilotage Directions define the circumstances where pilotage is compulsory, how and to which vessels they apply, and in what circumstances. GHT authorises pilots and issues Pilotage Exemption Certificates where appropriate.

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<sup>3</sup> International Convention for the Safety of Life at Sea, 1974, as amended 2014  
Document Ref GHT 6, Issue 17 dated 31 January 2019

## **4.8 Collision Regulations**

The International Regulations for Preventing Collisions at Sea 1972<sup>4</sup> apply to all vessels navigating within the harbour

## **4.9 Enforcement**

The Trustees will monitor and, where appropriate, actively enforce compliance with the Gloucester Harbour bye-laws and directions. An apparent contravention of such bye-laws or directions may result in the prosecution of the offender. The policies regarding enforcement and prosecution are defined in the Harbour Management Plan.

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<sup>4</sup> Published by the International Maritime Organization  
Document Ref GHT 6, Issue 17 dated 31 January 2019

## 5. The GHT Safety Management System

### 5.1 The SMS

The Safety Management System is represented in figure 3 and comprises:

- The Safety Policy defined by the GHT Trustees (section 2 refers).
- The Organisation that delivers safety (section 5.2).
- A document set that defines the planning and implementation of Harbour activities with the aim of reducing potential safety risks to as low as reasonably practicable (section 5.3).
- A process to identify, assess, record and manage risks (section 6 refers). In GHT this includes a software tool to assist with hazard and risk management recording.
- A process for reporting accidents. Incidents and near misses (section 7).
- A process of continuous improvement through active monitoring, measurement, reporting on safety performance, and embodying lessons learnt as a result of experience (section 8).

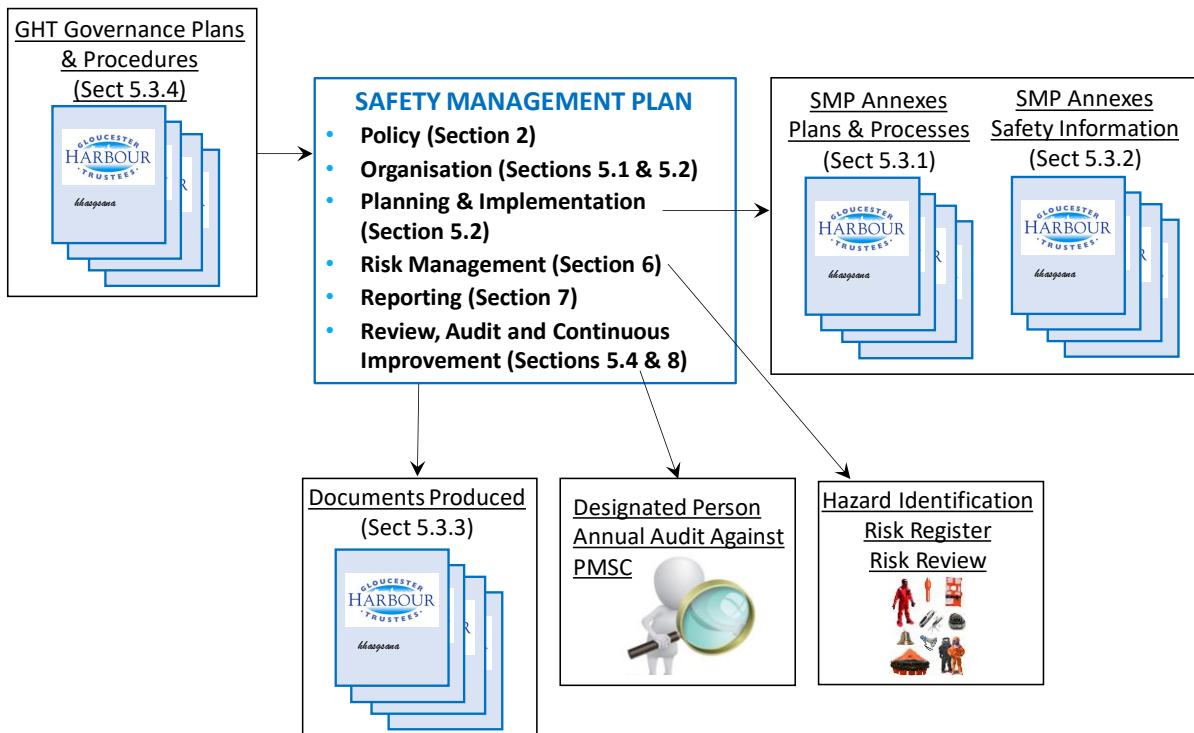


Figure 3 – The GHT Safety Management System

## 5.2 Organisation and Responsibilities

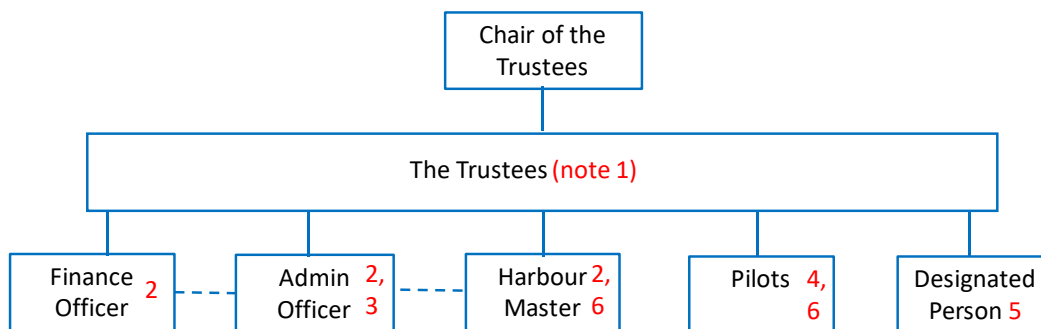
### 5.2.1 Organisation

The overall responsibility for health and safety lies with the Trustees. The responsibility for executing the policy, however, rests with the Officers.

Employees and contracted staff are recruited and selected on their suitability for the work to be undertaken. Each position has a job description, which describes jobholder's responsibilities and duties.

Training is provided and instructions given as necessary. The level of supervision provided is dependent on the complexity of the task and the experience of the individual.

The organisation of staff within GHT is shown in figure 4. Terms of Reference are provided (section 5.3.4, item 9).



#### Notes

1. There are up to 10 Trustees, including Harbour Master (as GHT's principal operational officer and ex-officio Trustee)
2. Employed Staff
3. Administrative Officer supports Finance Officer on financial matters and Harbour Master on marine matters
4. Contracted to Gloucester Pilots' Partnership LLP
5. Reports to Trustees on Safety Matters
6. The role of "Duty Harbour Master" is undertaken by the Duty Pilot when the HM is unavailable

Figure 4 – Organisational Chart for GHT

### 5.2.2 Duty Holder

The role of Duty Holder, as defined in the PMSC, is undertaken by the Trustees, named in Appendix 1, who are collectively and individually accountable for marine safety under the Code. The Duty Holders acknowledge that their accountability for compliance with the Code cannot be assigned or delegated.

### 5.2.3 Designated Person

The “Designated Person” (as defined in the PMSC) is a person independent of the day-to-day operation of the Harbour with appropriate qualifications and experience in safety management. The Trustees have appointed the person named in Appendix 1 as Designated Person, to provide Review and Assurance to the Trustees, in their role as “Duty Holder” that the marine Safety Management System is compliant with the requirements of the PMSC and is working effectively. The competencies of the Designated Person are in line with those recommended by the Guide to Good Practice.

### 5.2.4 Responsibility for Safe Navigation

For commercial vessels, safe navigation is the responsibility of their Masters assisted by the pilots. GHT authorise the pilots and provide the Harbour’s aids to navigation, along with information (for example surveys, Notices to Mariners and other guidance documentation).

For leisure craft, safe navigation is the responsibility of the person in charge of the craft. As with commercial vessels, GHT provides the Harbour’s aids to navigation, along with information, specifically safety guidance notes for users of small craft in the estuary (Annex H).

GHT information to aid safe navigation is downloadable from GHT’s website, [www.gloucesterharbourtrustees.org.uk](http://www.gloucesterharbourtrustees.org.uk)

## 5.3 **SMS Documentation**

The Safety Management System comprises a substantial documentation set. This comprises (a) Plans and Processes that are designed to reduce safety risks to ALARP, (b) information documents, (c) documentation produced by the Safety Management function. These documents are listed below. There is also a documentation set concerned with general governance of GHT and there are relevant non-GHT documents.

### 5.3.1 Plans and Processes

<b>Document Title</b>	<b>Purpose</b>	<b>Reference</b>
Safety Management Plan	The top level Plan that defines GHT’s Safety Management System	
Commercial Vessel Passage Planning for the Gloucester Harbour	Procedures for commercial vessels operating in Gloucester Harbour, including information required from vessels prior to passage, procedures relating to arriving at/ departing from Sharpness, Sharpness Old Dock and Lydney, and considerations relating to minimum under-keel clearance and restricted visibility.	Annex A to SMP

Pilotage Directions	Directions relating to pilotage in Gloucester Harbour.	Annex B to SMP
Authorisation of Pilots and Applications for Pilot Exemption Certificates	Defines pilot training and authorisation, including examination requirements, and Pilotage Exemption Certificates.	Annex C to SMP
Towage Guidelines for the Gloucester Harbour	Defines guidelines and requirements relating to tugs and towage.	Annex D to SMP
Workboat Operations	Procedures relating to operating the GHT workboat(s).	Annex E to SMP
GHT Emergency Procedures	Defines incident reporting, search and rescue, potential emergencies specific to Gloucester Harbour and relevant contact numbers. This is a RESTRICTED document because it contains sensitive contact information and cannot be made public. It is under the custodianship of the Harbourmaster.	Annex F to SMP
GHT Oil Spillage Contingency Plan	Defines actions to be taken in event of oil spillage and similar pollution events. This is a RESTRICTED document because it contains sensitive contact information and cannot be made public. It is under the custodianship of the Harbourmaster.	Annex G to SMP

### 5.3.2 Information Documents

Document Title	Purpose	Reference
Recreational Craft Safety	Safety information for skippers of recreational craft, including information on availability of Pilotage.	Annex H to SMP
Severn Estuary Navigation Aids Past and Present	Describes both current and historical navigation aids in Gloucester Harbour.	Annex I to SMP
Severn Bore Safety	Safety for people viewing or surfing the Severn Bore	Annex J to SMP
General Directions	Directions with which all vessels must comply	Annex K to SMP
Job Descriptions	Functions of staff and board members	Annex L to SMP





### 5.3.3 Documents Produced by the Safety Management Function

Document	Comment
GHT Notices to Mariners	Produced as required and filed with the UKHO
Low Water Channel Inspection Reports	Produced at regular intervals by the pilots
Incident Report Form (Appendix 1 to SMP)	Appendix 1 to SMP
Boatmaster Licence	Held by Harbourmaster
Hazman II	Risk Management database
Annual SMS Audit Reports	Produced by Designated Person to record annual audit against PMSC

### 5.3.4 Documentation Concerned with General Governance of GHT

The following documents define the general governance of GHT:

1. Gloucester Harbour Revision Order 1994
2. The Gloucester Harbour Revision (Constitution) Order 2002
3. Gloucester Harbour Byelaws 1997 to 2006
4. GHT General Directions
5. Index of GHT's Local Act Powers
6. Gloucester Harbour Strategic Plan
7. Gloucester Harbour Management Plan
8. GHT Standing Orders
9. GHT Key Personnel Terms of Reference
10. GHT Environmental Appraisal Procedures
11. Agreement between GHT and Gloucester Pilots Partnership LLP
12. GHT Annual Report and Accounts (includes a report on safety performance against KPIs)
13. Report from GHT to Stakeholders

### 5.3.5 Relevant Non-GHT Documentation

Section 11, References, lists non-GHT documentation that is relevant to the GHT SMS.

## 5.4 **Monitoring, Audit and Continuous Improvement**

Systematic monitoring, review and continuous improvement of safety is an important component of the SMS and is described in section 8 of this document.

## 6. Management of Safety Hazards & Risks

### 6.1 Introduction

This section discusses the hazard and risk management process, then considerations specific to the operation of Gloucester Harbour, and finally it lists the hazards and risks as recorded in the Risk Register.

### 6.2 Hazard and Risk Management Process

#### 6.2.1 Definitions

A **HAZARD** is something that can cause harm, e.g. collision, electricity, chemicals, working at height, noise, drowning, stress, etc.

A **RISK** is the product of the probability of a hazard occurring and the consequences of the hazard if it does occur.

#### 6.2.2 Process

All operations/activities undertaken in the operation of the Harbour that carry potential hazards are subjected to risk assessment. This process begins with hazard identification and a consideration of whether working practices can eliminate the hazard – for example lowering a tower structure for maintenance rather than working on it at height. If so, they are written into GHT Plans and Procedures.

Where hazards cannot be eliminated, an assessment of the risk is undertaken, a combination of the probability of the hazard causing an incident and the possible severity consequences of the incident. Potential risk reduction measures – to reduce the probability of occurrence and/or consequence – are devised and incorporated into GHT Plans and Procedures.

The numerical values of probability of occurrence and consequence are combined to score the risks. A ranked risk listing is produced and maintained using an off-the-shelf software tool, the Marico 'Hazman II'.

The risks are reviewed by the Harbourmaster at intervals and by the Collaborative Safety Management Forum (see section 5.4) at 6-monthly intervals.

#### 6.2.3 Risk Assessment

Table 1 shows probability of occurrence (frequency) scale used in Hazman.

Scale	Description	Definition
F5	Frequent	One or more times a year
F4	Likely	At least once a decade
F3	Possible	At least once in 100 years
F2	Unlikely	At least once in 1000 years
F1	Remote	Less than once in 1000 years

Table 1 – Risk Probability of Occurrence (Frequency) Definitions

Table 2 shows the severity definitions used in Hazman, in terms of consequences to people, property, the environment or the business.

Cat.	People	Property	Environment	Business
<b>C1</b>	<b>Negligible</b> Possible very minor injury (e.g. bruising)	<b>Negligible</b> Costs <10k	<b>Negligible</b> No effect of note. Tier1 <u>may</u> be declared but criteria not necessarily met. Costs <10k	<b>Negligible</b> Costs <10k
<b>C2</b>	<b>Minor</b> (single minor injury)	<b>Minor</b> Minor damage Costs 10k – 100k	<b>Minor</b> Tier 1 – Tier 2 criteria reached. Small operational (oil) spill with little effect on environmental amenity Costs 10K–100k	<b>Minor</b> Bad local publicity and/or short-term loss of revenue Costs 10k – 100k
<b>C3</b>	<b>Moderate</b> Multiple minor or single major injury	<b>Moderate</b> Moderate damage Costs 100k - 1M	<b>Moderate</b> Tier 2 spill criteria reached but capable of being limited to immediate area within site Costs 100k -1M	<b>Moderate</b> Bad widespread publicity Temporary suspension of operations or prolonged restrictions Costs 100k - 1M
<b>C4</b>	<b>Major</b> Multiple major injuries or single fatality	<b>Major</b> Major damage Costs 1M -10M	<b>Major</b> Tier 3 criteria reached with pollution requiring national support. Chemical spillage or small gas release Costs 1M - 10M	<b>Major</b> National publicity, Temporary closure Costs 1M -10M
<b>C5</b>	<b>Catastrophic</b> Multiple fatalities	<b>Catastrophic</b> Catastrophic damage Costs >10M	<b>Catastrophic</b> Tier 3 oil spill criteria reached. International support required. Widespread shoreline contamination. Serious chemical or gas release. Significant threat to environmental amenity. Costs >10M	<b>Catastrophic</b> International media publicity. Operations and revenue seriously disrupted for more than two days. Ensuing loss of revenue. Costs >10M

Table 2 – Risk Severity (Consequence) Definitions

### 6.3 Considerations Specific to the Operation if Gloucester Harbour

The following Gloucester Harbour-specific factors are relevant to the assessment and management of the hazards and risks as documented in section 6.5.

#### 6.3.1 Tug Availability

It is considered that a permanent tug presence at Sharpness is not viable given the constraints imposed by the tidal regime and the operation of the lock and basin gates at the entrance to Sharpness Docks.

However, tug and towage facilities are available from Bristol Port (Royal Portbury and Avonmouth) and Newport docks. The Bristol Port fleet is not permanently manned but the duty crew would expect to have a tug in the lock within one hour of call-out. Movement through the Royal Portbury Lock or Avonmouth locks is possible from 4h before HW to 3h after HW. The tugs available draw between 3.5 and 5.5 metres. HW Avonmouth is approx. 45 minutes before HW Sharpness. Depending upon tidal levels and timing, it may be possible to provide tug assistance to disabled outbound vessels in the lower section of the Gloucester Harbour between Inward Rocks and the seaward limit, and for inbound vessels between the seaward limit and Sharpness.

**Therefore, the probability of successfully recovering a disabled vessel with tug assistance is assessed as 'high', provided that the vessel has been able to anchor in an appropriate location. Otherwise, 'moderate', but depending on circumstances.**

#### 6.3.2 Failure of Ship's Navigational Equipment in Poor Visibility

When navigational equipment aboard a vessel subject to compulsory pilotage fails in poor visibility such that the standard onshore lights and marks cannot be seen, the Pilot will advise the Master on the practicalities of continuing the voyage. Portable Pilot Units are carried to provide independent AIS/GPS position information of own and other vessels within the Gloucester Harbour, specifically in the vicinity of the two Severn road bridges, thereby assisting the vessel to either continue on its voyage or be guided to a suitable location.

**Therefore, the overall probability of navigation equipment being inadequate due to ship equipment failures is considered to be low. There are highly redundant nav aids in the most critical areas of the passages.**

#### 6.3.3 Underkeel Clearance within the Gloucester Harbour

The point at which least underkeel clearance may be found by commercial vessels during normal navigation is the outer sill at Sharpness Docks. The sill is 0.5m above local chart datum. The published Canal & River Trust minimum underkeel clearance required before vessels will be permitted to cross the sill varies from 0.61m to 0.91m.

**The pilot ensures, through continual assessment of the prevailing conditions, the time of high water, the characteristics of the vessel and adjustment of speed, that adequate underkeel clearance is maintained throughout the passage. For normal operations this is unlikely to be less than 1 metre west of the Bull Channel with the vessel in the deep water channel.**

#### 6.3.4 When the Required Minimum Underkeel Clearance for Entry to Sharpness is Not Reached

Under certain conditions, it has been known for the tide to fall short of the predicted rise, leaving a vessel with insufficient clearance to enter Sharpness Docks. In this circumstance, the vessel would be expected to depart to a safe anchorage and resume the passage on a subsequent tide. Provided that the vessel is free from any defects in navigation, propulsion or manoeuvring equipment and departs promptly, adequate and safe underkeel clearance will be maintained throughout the

Document Ref GHT 6, Issue 17 dated 31 January 2019

Gloucester Harbour as the tide ebbs. The return voyage should not be undertaken in conditions of deteriorating weather or visibility.

**Monitoring of tide heights and meteorological conditions enables an assessment of the likelihood of the predicted tide height being reached prior to a vessel entering the harbour area.**

**Probability of a vessel unsuccessfully undertaking the return voyage: 'low'.**

#### 6.3.5 Normal Navigation

Within the Gloucester Harbour, the tracks to be followed are indicated by a series of regularly inspected and maintained shore-based marks and transits, as well as several buoys and beacons adjacent to the channel. These are visible at appropriate distances and in the normally-prevailing conditions of visibility. Standard navigational procedures are set out in Annex A.

**Probability of significant failure of GHT nav aids during passage: 'low'.**

#### 6.3.6 Failure of GHT Navigation Aids

Offshore buoys and beacons are lit by solar/battery power and lamps with built-in redundancy. Onshore marks are lit by mains electricity. Offshore buoys and beacons are securely fastened to the river bed and are not subject to periodic shift in position. Onshore marks carry distinctive daymarks.

**Availability of navigations aids (typically 99.99%) well exceeds IALA and Trinity House availability criteria. Risk of failure: 'low'.**

#### 6.3.7 Compulsory Pilotage

Most commercial vessels are subject to compulsory pilotage (see Pilotage Directions, Annex B).

#### 6.3.8 Second Pilot/Use of Helmsman

When considered necessary by the pilot and/or Harbour Master, a second pilot will be embarked to act as helmsman and assistant. (Refer to Pilotage Directions, Annex B).

### 6.3.9 Passage Plan

Masters of vessels are required by international law to prepare passage plans and to declare any defects which may affect the safe conduct of the vessel. Pilotage passage plans are also prepared by the pilots and discussed with the Master prior to and during the voyage. A pilotage passage plan specific to passenger vessel operations is provided for the use of such vessels. See Annex A.

### 6.3.10 Pilot Embarkation and Disembarkation Areas

Pilot embarkation and disembarkation areas are clearly defined on the appropriate chart, and particular reference is made through local Notices to Mariners and in Admiralty List of Radio Signals Vol. 6 to the usual embarkation/disembarkation point to be used by Sharpness-bound vessels. The use of alternative areas in the event of adverse weather or other factors is to be agreed by the Master and/or pilot and the pilot boat.

### 6.3.11 Pilot Boat

Pilot embarkation and disembarkation is currently carried out using properly manned and certificated boats and crew under an arrangement with an adjoining harbour authority, the Bristol Port Company. The Trustees do not operate or maintain craft for this purpose. Reference D provides the appropriate procedures for pilot embarkation and disembarkation.

### 6.3.12 Contingency and Emergency Arrangements

The procedures to follow for contingencies and emergencies are set out in GHT Emergency Procedures (Annex F). This document specifies the actions to be taken to ensure a timely and effective response to a range of possible events within the powers of the organisation. This is a RESTRICTED document because it contains sensitive contact information and cannot be made public. It is under the custodianship of the Harbourmaster.

### 6.3.13 Oil Spill Contingency

Annex G is an OPRC-compliant Oil Spill Contingency Plan. This is a RESTRICTED document because it contains sensitive contact information and cannot be made public. It is under the custodianship of the Harbourmaster.

## 6.4 Risk Controls

The following risk controls are embodied in the GHT Safety Management System:

Instructions and Information to promote safe working procedures	<ul style="list-style-type: none"><li>• The documentation set listed in section 5.3</li><li>• Accurate tide and weather Information</li></ul>
Training	<ul style="list-style-type: none"><li>• Formal Training, Assessment and Authorisation of pilots and PEC Holders</li></ul>

	<ul style="list-style-type: none"> <li>• Formal Oil Spill Response Training</li> <li>• Continued Professional Development for harbourmaster</li> </ul>
Risk Assessment	<ul style="list-style-type: none"> <li>• As defined in this section of the SMP and the Hazman risk database.</li> </ul>
Hardware	<ul style="list-style-type: none"> <li>• VHF equipment with sufficient range to communicate with both commercial and recreational craft within the harbour limits</li> <li>• AIS monitoring facilities</li> <li>• Aids to Navigation (Buoys, Beacons, Lights etc.)</li> <li>• On-line Tide and Weather Information</li> <li>• Portable Pilot Units using AIS and GPS</li> </ul>

## 6.5 Risk Register

The 'Generic Maritime Accident' Categories listed in Annex B of the International Maritime Organisation document "Formal Safety Assessment" (reference H) are all pertinent to the operational procedures associated with the movement of craft throughout the Gloucester Harbour and are used in this Hazard and Risk Register.

Risks are listed below in risk score order – highest first. Detailed numerical scores are provided in Appendix 4.

### 6.5.1 Navigation Risks

Rank	Reference	Title	Hazard Detail	Risk Score
1	10	Collision between large vessel and recreational craft	Recreational craft navigating or anchored in main channel whilst large vessel is also navigating in main channel. Main channel is designated a "narrow channel" for the purposes of COLREGS.	4.35
2	11	Collision between recreational craft	Recreational/leisure craft collide with each other	4.01
3	18	A Passenger Vessel collides with a Small Vessel	A Passenger Vessel collides with a Small Vessel	3.91
4	16	Commercial Vessel collides with a Passenger Vessel	Commercial Vessel collides with a Passenger Vessel	3.87
5	17	A Passenger Vessel collides with another Passenger Vessel	A Passenger Vessel collides with another Passenger Vessel	3.81

Rank	Reference	Title	Hazard Detail	Risk Score
6	23	Stranding - Passenger Vessel	Passenger vessel becomes fixed on an underwater feature or object, e.g. rock outcrop or sandbank such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels.	3.28
7	12	Grounding - commercial vessel	A vessel coming to rest on or riding across underwater features or objects due to being out of position or attempting to navigate at an inappropriate time.	3.25
8	9	Collision between large (commercial) vessels	Commercial ships colliding at port entrance or en-route; same or opposite directions.	3.08
9	4	Commercial vessel or Passenger vessel making contact with a buoy or beacon	A commercial vessel or a passenger vessel transiting the harbour area contacts a fixed or floating aid to navigation	3
10	22	Grounding - Passenger Vessel	The vessel comes to rest or rides across underwater features or objects due to being out of position or attempting to navigate at an inappropriate time.	2.88
11	5	Commercial vessel contacts Severn Road Bridge or Second Severn Crossing	A commercial vessel makes contact with one of the road bridges during a passage through the harbour area	2.87
12	8	Small craft contact fishery structures	Small craft may come into contact with the submerged remains of old fishery structures (rows of wooden stakes) or current (steel) structures used for fishing purposes.	2.78
13	19	A large vessel contacts the Second Severn Crossing, the Severn Bridge, the Wye Bridge or Chepstow Bridge	Commercial vessel or passenger vessel makes contact with bridge piers/buttresses/caissons during navigation or as a result of a breakdown.	2.57
14	6	Commercial vessel makes heavy contact with the piers at the entrance to the dock	Vessel makes contact with a pier whilst approaching the entrance to Sharpness Dock	2.52
15	13	Stranding of a commercial vessel	Commercial vessel becomes fixed on an underwater feature or object, e.g. rock outcrop or sandbank such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels.	2.42
16	7	Passenger vessel contacts pier at Sharpness Old Dock or at Lydney Dock	Passenger vessel makes heavy contact with the pier during berthing manoeuvres at Sharpness Old Dock or at Lydney Dock	2.09
17	20	A small craft (leisure/recreational) contacts a navigation aid	Small craft may contact an aid to navigation, causing damage to hull and/or rigging; vessel may get caught in structure due to strength of tide/wind.	1.69



Rank	Reference	Title	Hazard Detail	Risk Score
18	14	Stranding of a recreational/leisure vessel	Recreational/leisure vessel becomes fixed on an underwater feature or object, e.g. rock outcrop or sandbank such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels.	0.91
19	21	Grounding of a recreational/leisure vessel	A vessel coming to rest on or riding across underwater features or objects due to being out of position or attempting to navigate at an inappropriate time.	0.76
20	15	Contact with small craft mooring buoy or racing mark and chain	Unregulated moorings and buoy installations may present a hazard to small craft navigating in the harbour area, particularly if unlit or partially/completely submerged due to strength of tide or length of mooring chain. Unlikely to damage hull but could present a tangle hazard for propellers and fixed keel craft.	0.76

#### 6.5.2 Risks Associated With Maintenance Activities Ashore and Afloat

Rank	Reference	Title	Hazard Detail	Risk Score
1	3	Personal Injury (ashore)	Slips, trips, falls, exposure, cuts, grazes, falling items. All encountered during routine maintenance activities.	3.1
2	4	Large tidal range, strong tidal flows	Can affect work at sites of all offshore aids to navigation accessible on foot or by boat; could result in loss of or injury to personnel, trips and falls, loss of equipment if cut off by tide.	3.1
3	5	Working on, or close to, water.	Large tidal range and strong currents may be encountered whilst travelling to and working on aids to navigation (offshore) and when launching/recovering the workboat. Water may be contaminated (sewage, Weil's Disease).	3.1
4	1	Fall from mast (onshore)	Falling from height whilst carrying out maintenance activities at onshore aids to navigation, e.g. changing light units, painting, cleaning.	2.89
5	2	Fall from mast (offshore)	Falling from height whilst carrying out maintenance activities at offshore aids to navigation.	2.63

## **7. Incident Control and Reporting**

All accidents, incidents and near-misses with implications for the health and safety of persons and vessels shall be promptly reported and investigated. Actions to prevent a recurrence shall be implemented and lessons learnt shall be promulgated to staff and contractors. The GHT Incident Reporting form at Appendix 2 shall be used.

A reporting regime which draws any unsafe act or condition to the attention of the Officers shall be promoted and feedback given.

Following a report of an incident involving one or more vessels, the Harbour Master will undertake an investigation. This will establish whether there has been a failure to comply with local byelaws or national legislation, and whether further action is required. The Harbour Master will also investigate the circumstances of the incident with regard to the Safety Management System and associated risk assessments and establish whether there is a need to review the relevant hazard and its associated control measures. This review will involve the Designated Person, pilots and other Harbour users. The outcome will be reported to the Trustees.

Records are maintained (in both written and electronic form using 'Hazman' software) of incidents which occur within the Harbour Authority area.

Where appropriate the requirements of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 (as summarised in MGN 458 (M+F) Accident Reporting and Investigation) will inform the reporting and investigation process.

## 8. Monitoring, Review and Continuous Improvement

GHT shall operate a process of continuous improvement through active monitoring, measurement, reporting on safety performance, and embodying lessons learnt as a result of experience.

### 8.1 Collaborative Safety Management Forum

GHT runs a Collaborative Safety Management Forum that is chaired by the Harbour Master and attended by representatives from Gloucester Pilots Partnership, the Canal & River Trust, the main resident users of the port of Sharpness - namely Victoria Group, who run Sharpness Dock, and Sharpness Shipyard and Drydock Ltd - and the Severn Area Rescue Association. This meeting reviews:

- Have there been any noteworthy safety-related incidents, concerns/near misses during last 12 months? Are there lessons that can be learnt? How have or should lessons learnt been/be captured? What actions have been taken as a result?
- Are there any safety-related concerns not identified above?
- The GHT Risk Register for completeness – any new risks to add? The grading of probability and consequence; whether avoidance and mitigation strategies remain appropriate.

### 8.2 Trustees' Oversight

Safety is always on the agenda of Trustee meetings and the Harbour Master and Senior Pilot will raise all safety concerns, incidents or near misses for consideration by the Trustees.

### 8.3 Audit Against the Port Marine Safety Code

The Designated Person undertakes an independent audit of the Safety Management System against the PMSC (ref A) and the Guide to Good Practice (ref B) using an "Aide Memoire" attached as an Annex to reference B. The findings are reported to the Trustees, as Duty Holder. Statements of compliance with the PMSC are made every three years, in accordance with the suggested reporting scheme; the most recent Statement of Compliance is reproduced in section 2.1.

### 8.4 Key Performance Indicators

Key Performance Indicators (KPIs) are part of this Safety Management System and are taken into consideration when compiling risk assessments. GHT reports its safety performance against the KPIs in the GHT Annual Report to Stakeholders. The KPIs are:

- a. Collisions
- b. Groundings
- c. Sinking/Capsize
- d. Impact/Contact
- e. Fire/Explosion

- f. Oil Pollution
- g. Availability of Aids to Navigation
- h. Availability of Tide and Weather Data

## **8.5 Aids to Navigation**

Aids to navigation are inspected annually by Trinity House. An ongoing programme of maintenance and improvement to the aids is implemented, in order to take advantage of technology advances, improve availability and performance (e.g. visibility) and make for safer maintenance.

## **8.6 SMS Review**

All SMS Plans and Procedures are reviewed on a rolling basis at least every three years. All legislation, byelaws and directions are reviewed on a regular basis to ensure they are fit for purpose.

The person generally responsible for the review of marine procedures is the Harbour Master. Where other personnel are responsible for or involved in the review of other procedures, this is identified in those procedures.

## 9. References

- A. 'Port Marine Safety Code', Maritime & Coastguard Agency dated November 2016
- B. 'A Guide to Good Practice on Port Operations', Maritime & Coastguard Agency updated February 2018
- C. British Admiralty Chart No. 1166
- D. 'The Embarkation & Disembarkation of Pilots Code of Safe Practice' - Revised July 2017
- E. Canal & River Trust 'Safety Management System for the Port of Sharpness', 2018
- F. HSE document 'Managing for Health and Safety', ref HSG 65 dated 2013
- G. HSE document 'Reducing Risks, Protecting People' dated 2001
- H. International Maritime Organisation document "Formal Safety Assessment" (IMO MSC 69/INF.14 12.02.98)

## Appendix 1 – Duty Holder and Designated Person

### Duty Holder

The role of Duty Holder, as defined in the PMSC, is undertaken by the Trustees, named below, who are collectively and individually accountable for marine safety under the Code. The Duty Holders acknowledge that their accountability for compliance with the Code cannot be assigned or delegated.

The Trustees (January 2019):	Gordon Craig	(Chairman)
	Nigel Vaughan	(Vice Chairman)
	Barry Leat	
	Mike Johnson	
	John Christie	
	Garry Strickland	
	Carl Merry	
	Anthony Potts	
	Geoffrey Comer	

### Designated Person

The Trustees have appointed Nigel Vaughan (a current Trustee) as the “Designated Person”, as defined by the PMSC, to provide Review and Assurance to the Duty Holder that the marine Safety Management System is compliant with the requirements of the PMSC and is working effectively. The competencies of the Designated Person are in line with those recommended by the Guide to Good Practice.

## Appendix 2 - Incident Report Form



### Incident Report Form

To be used to report and record all incidents of failure of propulsion, manoeuvring or steering equipment and groundings, strandings, contact, collision or injury within the Gloucester Harbour. Reports to be submitted to Gloucester Harbour Trustees within 24 hours of the incident.

E-mail: [incident@gloucesterharbourtrustees.org.uk](mailto:incident@gloucesterharbourtrustees.org.uk) Tel: 01453 811913 VHF Ch. 13 "Sharpness Radio"

- (1) VESSEL NAME:
- (2) VESSEL TYPE:
- (3) DATE OF INCIDENT:
- (4) TIME OF INCIDENT:
- (5) LOCATION OF INCIDENT (Lat/Long or other reference):
- (6) NATURE OF INCIDENT:
- (7) EMERGENCY ACTIONS TAKEN:

- |                                   | Y                        | N                        |                            |
|-----------------------------------|--------------------------|--------------------------|----------------------------|
| (8) INJURY TO PERSONNEL           | <input type="checkbox"/> | <input type="checkbox"/> | No. of personnel affected: |
| (9) DAMAGE TO VESSEL              | <input type="checkbox"/> | <input type="checkbox"/> | Above/below waterline:     |
| (10) DAMAGE TO NAVIGATION AIDS    | <input type="checkbox"/> | <input type="checkbox"/> | Name of aid:               |
| (11) EXTERNAL ASSISTANCE REQUIRED | <input type="checkbox"/> | <input type="checkbox"/> | Type of assistance:        |
| (12) COASTGUARD NOTIFIED          | <input type="checkbox"/> | <input type="checkbox"/> | Time of notification:      |

In the event of an affirmative response to any of items (8) to (12) above, the Harbour Master must be advised at the time of the incident and a full report submitted to Gloucester Harbour Trustees within 24 hours of the incident.

- (13) NAME OF PERSON SUBMITTING THIS REPORT:
  - (14) CONTACT DETAILS:
-

**For GHT office use only:**

Received by:

Incident No:

Date:

Time:

**POST-INCIDENT ACTION REPORT**

Incident No:

Action taken:

By:

Date:



## Appendix 3 – Risk Register (13 March 2017)

### Navigation Risks

Rank	Reference	Title	Hazard Detail	Overall	Most Likely Risk				Worst Credible Risk			
					Environment	People	Property Vessels and Structures	Stakeholders	Environment	People	Property Vessels and Structures	Stakeholders
1	10	Collision between large vessel and recreational craft	Recreational craft navigating or anchored in main channel whilst large vessel is also navigating in main channel. Main channel is designated a "narrow channel" for the purposes of COLREGS.	4.35	0	5.92	3.5	0	0	5.92	2.43	4.43
2	11	Collision between recreational craft	Recreational/leisure craft collide with each other	4.01	0	5.92	0	0	0	5.92	2.43	2.43
3	18	A Passenger Vessel collides with a Small Vessel	A Passenger Vessel collides with a Small Vessel	3.91	0	4.43	0	2.43	0	5.92	2.43	5.92
4	16	Commercial Vessel collides with a Passenger Vessel	Commercial Vessel collides with a Passenger Vessel	3.87	0	3.5	3.5	3.5	3.5	4.85	4.85	4.85
5	17	A Passenger Vessel collides with another Passenger Vessel	A Passenger Vessel collides with another Passenger Vessel	3.81	0	3.5	3.5	3.5	2.87	5.09	4.08	4.08
6	23	Stranding - Passenger Vessel	Passenger vessel becomes fixed on an underwater feature or object, e.g. rock outcrop or sandbank such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels.	3.28	0	2.43	2.43	2.43	4.43	4.43	4.43	4.43
7	12	Grounding - commercial vessel	A vessel coming to rest on or riding across underwater features or objects due to being out of position or attempting to navigate at an inappropriate time.	3.25	3.5	0	0	3.5	4.43	4.43	0	4.43
8	9	Collision between large (commercial) vessels	Commercial ships colliding at port entrance or en-route; same or opposite directions.	3.08	0	0	2.43	2.43	3.5	3.5	4.85	3.5

Rank	Reference	Title	Hazard Detail	Overall	Most Likely Risk				Worst Credible Risk			
					Environment	People	Property Vessels and Structures	Stakeholders	Environment	People	Property Vessels and Structures	Stakeholders
9	4	Commercial vessel or Passenger vessel making contact with a buoy or beacon	A commercial vessel or a passenger vessel transiting the harbour area contacts a fixed or floating aid to navigation	3	0	0	3.5	3.5	0	2.43	4.43	2.43
10	22	Grounding - Passenger Vessel	The vessel comes to rest or rides across underwater features or objects due to being out of position or attempting to navigate at an inappropriate time.	2.88	0	2.43	2.43	0	2.43	4.43	4.43	2.43
11	5	Commercial vessel contacts Severn Road Bridge or Second Severn Crossing	A commercial vessel makes contact with one of the road bridges during a passage through the harbour area	2.87	0	2.43	2.43	2.43	2.87	2.87	4.08	2.87
12	8	Small craft contact fishery structures	Small craft may come into contact with the submerged remains of old fishery structures (rows of wooden stakes) or current (steel) structures used for fishing purposes.	2.78	0	3.5	0	0	0	4.43	2.43	2.43
13	19	A large vessel contacts the Second Severn Crossing, the Severn Bridge, the Wye Bridge or Chepstow Bridge	Commercial vessel or passenger vessel makes contact with bridge piers/buttresses/caissons during navigation or as a result of a breakdown.	2.57	0	0	2.43	0	0	2.43	4.43	4.43
14	6	Commercial vessel makes heavy contact with the piers at the entrance to the dock	Vessel makes contact with a pier whilst approaching the entrance to Sharpness Dock	2.52	0	0	0	0	2.43	5.92	5.92	2.43
15	13	Stranding of a commercial vessel	Commercial vessel becomes fixed on an underwater feature or object, e.g. rock outcrop or sandbank such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels.	2.42	0	0	0	2.43	4.43	0	0	4.43

Rank	Reference	Title	Hazard Detail	Overall	Most Likely Risk				Worst Credible Risk			
					Environment	People	Property Vessels and Structures	Stakeholders	Environment	People	Property Vessels and Structures	Stakeholders
16	7	Passenger vessel contacts pier at Sharpness Old Dock or at Lydney Dock	Passenger vessel makes heavy contact with the pier during berthing manoeuvres at Sharpness Old Dock or at Lydney Dock	2.09	0	0	0	0	2.43	4.43	4.43	4.43
17	20	A small craft (leisure/recreational) contacts a navigation aid	Small craft may contact an aid to navigation, causing damage to hull and/or rigging; vessel may get caught in structure due to strength of tide/wind.	1.69	0	0	0	0	0	4.43	2.43	2.43
18	14	Stranding of a recreational/leisure vessel	Recreational/leisure vessel becomes fixed on an underwater feature or object, e.g. rock outcrop or sandbank such that the vessel cannot readily be moved by lightening, floating off or with assistance from other vessels.	0.91	0	0	0	0	0	2.43	0	2.43
19	21	Grounding of a recreational/leisure vessel	A vessel coming to rest on or riding across underwater features or objects due to being out of position or attempting to navigate at an inappropriate time.	0.76	0	0	0	0	0	2.43	0	0
20	15	Contact with small craft mooring buoy or racing mark and chain	Unregulated moorings and buoy installations may present a hazard to small craft navigating in the harbour area, particularly if unlit or partially/completely submerged due to strength of tide or length of mooring chain. Unlikely to damage hull but could present a tangle hazard for propellers and fixed keel craft.	0.76	0	0	0	0	0	2.43	0	0

## Maintenance activities ashore and afloat

Rank	Reference	Title	Hazard Detail	Overall	Most Likely Risk				Worst Credible Risk			
					Environment	People	Property	Stakeholders	Environment	People	Property	Stakeholders
1	3	Personal Injury (ashore)	Slips, trips, falls, exposure, cuts, grazes, falling items. All encountered during routine maintenance activities.	3.1	0	3.5	0	0	0	5.92	0	2.43
2	4	Large tidal range, strong tidal flows	Can affect work at sites of all offshore aids to navigation accessible on foot or by boat; could result in loss of or injury to personnel, trips and falls, loss of equipment if cut off by tide.	3.1	0	3.5	0	0	0	5.92	0	2.43
3	5	Working on, or close to, water.	Large tidal range and strong currents may be encountered whilst travelling to and working on aids to navigation (offshore) and when launching/recovering the workboat. Water may be contaminated (sewage, Weil's Disease).	3.1	0	3.5	0	0	0	5.92	0	2.43
4	1	Fall from mast (onshore)	Falling from height whilst carrying out maintenance activities at onshore aids to navigation, e.g. changing light units, painting, cleaning.	2.89	0	2.43	0	0	0	5.92	0	4.43
5	2	Fall from mast (offshore)	Falling from height whilst carrying out maintenance activities at offshore aids to navigation.	2.63	0	3.5	0	0	0	4.43	0	2.43

## Appendix 4 - Record of GHT's Safety Management Improvements

Actions taken by GHT since the post Sea Empress HM Government Review of the Pilotage Act commenced are listed below. In many instances this involved a review of procedures already in force under the relevant legislation relating to Harbour Authorities. These continue to be reviewed in accordance with the requirements of the PMSC.

1. October 1998 - Produced the Gloucester Harbour Byelaws which were confirmed by the Secretary of State (amended in May 2006 to incorporate the revised harbour area).
2. March 1999 - Issued General Directions (reviewed 2003, 2006, 2007, 2010, 2011)
3. June 1999 - Replaced the Hayward Buoy with a fixed structure.
4. March 2000 - Issued the Gloucester Harbour Management Plan (reviewed 2003, 2007, 2010, 2013)
5. August 2000 - Commissioned a hydrographic survey of the main navigation channel between the Second Severn Crossing (M4) and Hock Cliff near Fretherne on Severn. The results of this survey were submitted to UKHO which has issued a new edition of Chart No. 1166.
6. October 2000 - Approved Strategic Plan for the Authority (reviewed 2003, 2006, 2010, 2013).
7. 2000 - Formalised and implemented passage planning requirement, which includes the production of passage plans (reviewed June 2002, October 2008, April 2014).
8. 2001 - Carried out risk analysis and, following extensive consultation, approved a Safety Management Plan based thereon, updated in 2001, 2003, 2006, 2007, 2008, 2011, 2013, 2014, 2015
9. April 2004 - Negotiated a new agreement with the Gloucester Pilots Partnership, which has operated since January 1999, relating to the provision of a pilotage service for the Gloucester Harbour. The agreement covers manning levels and working arrangements. This was reviewed in March 2009 and again in March 2014. It is due to be reviewed again in March 2019.
10. 2005 - Replaced the Bull Beacon and tide gauge with a new structure.
11. 2007 - Reviewed and revised the Authority's Pilotage, and subsequently in 2008, 2009, 2010, 2012, 2013.
12. October 2007 - Replaced the Lyde Beacon with a new structure.
13. December 2008 - Improved the provision for recording radar data displayed by the Pilot Watch Radar, and again in 2012
14. January 2010 - formalised and set out the considerations pertaining to general navigation practice and to navigation during periods of restricted visibility to be observed by vessels subject to pilotage directions.
15. October 2010 - installed equipment to measure and display height of tide and certain meteorological information at Sharpness and made this data available on the Trustees' website.
16. March 2011 - formalised and set out the considerations pertaining to the circumstances (e.g. a combination of vessel dimensions, predicted tide heights and other local circumstances) which

might trigger a requirement for additional local consultation and assessment of factors that may affect vessel movements.

17. May 2011 - Replaced the Hills Flats buoy with a fixed structure.
18. May 2011 - Replaced the Counts buoy with a fixed structure incorporating a tide gauge.
19. August 2011 - Installed a beacon onshore to indicate the presence of a submerging obstruction.
20. March 2015 - Commissioned a hydrographic survey of the main navigation channel and adjacent features of interest between the seaward boundary of the Trustees' jurisdiction and Sharpness Point. Results passed to UKHO for inclusion in a new edition of Chart No. 1166.
21. November 2015 - Carried out additional risk analysis and revisions to passage planning relating to passenger vessel operations involving river berths at Lydney Dock and Sharpness Old Dock.
22. Appointed a 'Designated Person'.
23. Accepted the Trustees' role as 'the Duty Holder'.
24. Improved the format for the monthly low water surveys carried out by the Gloucester Pilots on behalf of the Authority.
25. Elevated safety and PMSC compliance to the first item of business on the agenda for the Trustees' bi-monthly meetings.
26. Renewed the Pilot Watch Radar System intrinsic to navigational safety in the approaches to Second Severn Crossing.
27. Formalised arrangements for Gloucester Pilots to report any defects in the navigation aids to the Authority's Marine Officer.
28. Improved the intensity and reliability of certain navigation lights.
29. Introduced modern solid state light sources for navigation aids.
30. Refined the information included in the Authority's Annual Report and Accounts.
31. Suspended the provision of an emergency mooring buoy at Northwick Roadstead on safety grounds.
32. June 2016 - the procedure used for the assessment and ranking of risk was reviewed. As a result, it was decided that the Marico 'Hazman 2' system would be adopted as a more suitable means of maintaining and reviewing the risk register. The risk assessment is now held and maintained 'on-line', where it may be accessed by authorised persons.
33. Introduced a documented quality control system which includes navigation aid maintenance, purchasing, safety reporting and other activities.
34. July 2018 - Replaced the Narlwood Beacons with new structures.
35. 2018 - Improved the daytime visibility of leading marks at Berkeley.
36. 2018 - Improved the visibility of leading marks at Fishinghouse.
37. 2018 - Introduced modern Portable Pilot Units utilising AIS, GPS and electronic charting.

## Appendix 5 – Index of GHT’s Local Act Powers

ADVISORY BODY		2002 HRO Art 12
ANCHORAGES	- provision of	1890 Act para 14
ANNUAL ACCOUNT	- to be sent to Minister	1936 Act s 9
ANNUAL STATEMENT	- need not be printed	1959 Act s 7
BORROWING POWERS	-	1988 HRO Art 7
	- temporary	1988 HRO Art 8
BYELAWS	-	1994 HRO Art 16
	- as to towage by steam tug	1890 Act s 20
CHAIRMAN	- re-appointment of	2002 HRO Sch 2 para 9
	- remuneration of	2002 HRO Sch 2 para 19
COMMITTEES	- appointment of	2002 HRO Sch 2 para 10
COMMON SEAL		1890 Act para 2
CONTRIBUTION	- acceptance of	1988 HRO Art 6
CONVENIENCES	- power to provide	1890 Act s 21
DECLARATIONS OF INTERESTS		2002 HRO Act 7
		2002 HRO Sch 1
DEFENCE	- of due diligence	1994 HRO Art 30
DIRECTIONS TO VESSELS	- enforcement of	1994 HRO Art 14
	- failure to comply with	1994 HRO Art 13
	- General	1994 HRO Art 10
	- General – publication of	1994 HRO Art 12
	- Master’s responsibility re	1994 HRO Art 15
	- Special	1994 HRO Art 11
DOCUMENTS	- authentication of seal	2002 HRO Sch 2 para 17
DREDGERS	- power to provide	1890 Act s 30
DREDGING	- appeals against refusal or conditions imposed	1994 HRO Art 21
	- licensing of	1994 HRO Art 20
DUES	- See Rates	
FISHING VESSELS	- seeking shelter in bad weather to be free of dues	1890 Act s 26
GIFTS	- acceptance of	1988 HRO Art 6
GHT	- Incorporation of as body corporate with perpetual succession	1890 Act para 2
GRANTS	- acceptance of	1988 HRO Art 6
GUARANTEES	- acceptance of	1988 HRO Art 6
HARBOUR	- limits of	2002 HRO Art 11
HARBOUR AUTHORITY	- GHT to be	1890 Act para 13
HARBOURS CLAUSES ACT 1847	- sections not incorporated -	1936 Act s 5
		1959 Act s 5
		1963 Act s 4
	- ‘vessel’ to include seaplane	1936 Act s 5

INQUIRIES	- by Minister	1953 Act s 12
INTERESTS	- declaration of	2002 HRO Art 7
	- register of	2002 HRO Sch 2 para 13
LAND	- power to purchase, lease and dispose of	1890 Act s 2
	- power to purchase by agreement	1890 Act s 11
LAND CLAUSES CONSOLIDATION ACTS 1845, 1860 & 1869	- incorporation of	1890 Act s 10
LANDING STAGES ETC	- repair of	1994 HRO Art 9
LIGHTS	- power to provide	(1889 Act s 13 (1890 Act s 14
	- power to maintain existing and erect new	(1889 Act s 13 (1890 Act s 17
	- vesting of existing lights pre 1890 in GHT	1890 Act s 17
LOANS	- acceptance of	1988 HRO Art 6
MEETINGS	- regulation of by Trustees	2002 HRO Sch 2 para 19
MINUTES	- to be taken	2002 HRO Sch 2 para 6
MOORINGS	- provision of	1890 Act para 14
NAVIGATION	- dangers to - provision against	1994 HRO Art 23
NAVIGATION AIDS	- power to provide	1994 HRO Art 7
OBSTRUCTIONS	- removal of other than vessels	1994 HRO Art 8
	- removal of	1890 Act para 14
OFFICERS	- power to appoint	2002 HRO Sch 2 para 20
POWERS	- General	1944 HRO Art 6
	- ballast etc. not to be cast into harbour	1890 Act s 14
	- conveniences - power to provide	1890 Act s 21
	- dredge	1890 Act s 14
	- dredgers - to provide	1890 Act s 30
	- harbour - to alter, maintain, improve, light & execute works	1890 Act s 14
	- land & property – to purchase, lease and dispose of	1890 Act s 2
	- lights	1890 Act s 14
	- lights - to maintain existing pre 1890 and erect new	1890 Act para 17
	- lighthouses lights beacons buoys and daymarks etc - power to maintain and erect	1889 Act s 13
	- navigation aids - to maintain existing and provide new	1890 Act para 17 1994 HRO Art 7
	- rates	1890 Act s 19
	- to levy	1889 Act s 15
	- to compound	1890 Act s 24
	- sue and be sued	1890 Act para 2
	- unseaworthy vessels	1890 Act para 14
	- warehouses - to provide	1890 Act s 21



	- wharfs - to provide	1890 Act s 21
	- wrecks – disposal of	1959 Act s 9
QUORUM		2002 HRO Sch 2 para 12
RATES	- application of rates, tolls, duties & charges	1890 Act s 29
	- increase of	1936 Act s 6
	- lighting	1889 Act s 14
	- power to compound	1890 Act s 24
	- power to lease	1890 Act s 27
	- power to levy	1890 Act s 19
	- services and accommodation	1959 Act s 6
	- seaplanes	1936 Act s 7
	- recovery of authorised	1963 Act s 8
	- revision of	1936 Act s 8
REPEALS AND REVOCATIONS		1936 Act s 12
		1953 Act s 13
		1994 HRO Art 31
		2002 HRO Art 13, Sch 3
RESERVE FUND		1959 Act s 8
		1988 HRO Art 5
RESOLUTIONS OUTSIDE MEETINGS		2002 HRO Sch 2 para 6
SAVINGS	- Bristol – Port of	1963 Act s 11
	- CRT (formerly BW) (as successor to Sharpness New Dock and Glos & Birmingham Navigation Co)	1889 Act s 13 & 23 1890 Act s 17
	- Commissioners of Sewers at Caldicot &Wentlooge	1890 Act s 15
	- Crown	1889 Act s 22
		1994 HRO Art 27
	- Crown interest in wrecks	1959 Act s 10
	- Environment Agency (formerly NRA)	1994 HRO Art 27
	- Glos & Birmingham Navigation Company (now CRT)	(1889 Act s 13 & 23 (1890 Act s 17
	- Severn Commissioners	1890 Act s 33
	- NRA (now EA)	1994 HRO Art 27
	- Sharpness New Docks (now CRT)	(1889 Act s 13 (1890 Act s 17
	- GWR re Severn Tunnel	1890 Act s 14
	- Trinity House	1994 HRO Art 27
SEAL		(1890 Act para 2 (2002 HRO Sch 2 para 7
SHARPNESS LIGHTHOUSE TRUSTEES	- GHT to perform duties of	1890 Act s 13
STEAM TUGS	- to be certified	1890 Act s 16
SUE	- power to sue and be sued	1890 Act s 2

TRUSTEES	<ul style="list-style-type: none"> <li>- addresses – change of to be notified to Clerk</li> <li>- appointment and terms of office</li> <li>- casual vacancies</li> <li>- constitution</li> <li>- declaration to be made by</li> <li>- disqualification</li> <li>- indemnity Insurance for</li> <li>- meetings of</li> <li>- payments to</li> <li>- provisions applying to</li> <li>- transitional provisions</li> <li>- vacancy - does not invalidate</li> <li>- vacation of office</li> </ul>	<ul style="list-style-type: none"> <li>2002 HRO Sch 2 para 21</li> <li>2002 HRO Art 4 &amp; 5</li> <li>2002 HRO Art 6</li> <li>2002 HRO Art 3</li> <li>2002 HRO Art 7 &amp; Sched I</li> <li>2002 HRO Art 8</li> <li>2002 HRO Art 9</li> <li>2002 HRO Sch 2 para 6</li> <li>2002 HRO Sch 2 para 18</li> <li>2002 HRO Art 10 &amp; Sch 2</li> <li>2002 HRO Art 4</li> <li>2002 HRO Sch 2 para 11</li> <li>2002 HRO Sch 2 para 7</li> </ul>
VICE-CHAIRMAN	<ul style="list-style-type: none"> <li>- appointment of</li> </ul>	<ul style="list-style-type: none"> <li>2002 HRO Sch 2 para 1</li> </ul>
WAREHOUSES WHARFS WORKS	<ul style="list-style-type: none"> <li>- power to provide</li> <li>- power to provide</li> <li>- abatement of works abandoned or decayed</li> <li>- appeals against refusal or conditions imposed</li> <li>- defacing – penalty for</li> <li>- licensing of</li> <li>- lights on - during construction</li> <li>- permanent</li> <li>- marking of works injured, destroyed or decayed</li> <li>- obstructing - penalty for</li> <li>- restrictions on</li> <li>- Statutory Undertakers – control of</li> <li>- survey of tidal works</li> </ul>	<ul style="list-style-type: none"> <li>1890 Act s 21</li> <li>1890 Act s 21</li> <li>1994 HRO Art 24</li> <li>1994 HRO Art 21</li> <li>1890 Act s 22</li> <li>1994 HRO Art 19</li> <li>1994 HRO Art 22</li> <li>1994 HRO Art 26</li> <li>1994 HRO Art 23</li> <li>1890 Act s 22</li> <li>1994 HRO Art 17</li> <li>1994 HRO</li> <li>1994 HRO Art 25</li> </ul>
WRECKS	<ul style="list-style-type: none"> <li>- disposal of</li> <li>- removal of</li> </ul>	<ul style="list-style-type: none"> <li>1959 Act s 9</li> <li>1890 Act s 14</li> </ul>