

TOWARDS 2000

A HISTORY OF GLOUCESTER HARBOUR TRUSTEES

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Clerk to the Trustees 1991-1996

PART 2
1966 – 2000

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FOREWORD

W A Stone, who was a former Clerk to the Trustees, published the first history of GHT in 1966 shortly before his death. That was a detailed survey of the evolution of navigational safety on the Severn from its infancy in the late 19th Century until 1966.

The Sixties to the Millennium was a period of transformation for the Trustees. During this time the Authority changed from dependence on British Waterways for both engineering and administrative support to become a self-contained professional unit adopting quality assurance as the measure of its working standards and maintaining its own web site as part of its widening role as a CHA.

This history attempts to chart that progress and describes the introduction of modern equipment and techniques to improve navigational safety.

The Millennium starts with the Port of Gloucester being chosen as the venue for the British Ports Association Conference 2000, underlining the national standing of England's most inland port.

This recognition does not, however, mean that the Trustees can rest on their laurels. The Review of Trust Ports will produce a major upheaval in management throughout the Ports Industry, with the keynote proposals of good governance, openness, accountability and fitness and a total overhaul of the appointments process.

The Port Marine Safety Code, arising from recommendations in the Review of the Pilotage Act 1987 following the grounding of the Sea Empress, restates the duties of Competent Harbour Authorities, sets out the need for the development of safety systems based on formal risk assessments, the promotion of rules (general and pilotage directions) for harbour users, and the strict control of the training and recruitment of pilots and staff. The intention of the Government is that all Harbour Authorities will comply with the minimum safety standards prescribed in the Code.

In April 2000 the Trustees received a report from their Parliamentary Agents, Dyson Bell Martin, on the implications of the Trusts Ports Review, and have since formulated plans which have to be implemented by July 2002. This is a heavy workload but will culminate in a challenging future for the Trustees at a time when ports are also having to come to terms with their obligations under the Habitats Directive and Environmental Legislation.

The compilation of this history has been an interesting, sometimes frustrating, task but I hope that it will provide to all an insight into the changing scene from the 60's into the new Millennium.

My thanks for considerable assistance and advice are due to the two Chairmen, Geoffrey Clayton and Ian Walker, and to the officers of the Trustees and Pilots, past and present.

Dennis Collins - Gloucester June 2000.

GLOSSARY

ABP	Associated British Ports
AGP	Amalgamated Gloucester Pilots.
ACOP	Advisory Committee on Pilotage.
ASERA	Association of Severn Estuary Relevant Authorities
BWB	British Waterways Board.
CHA	Competent Harbour Authority - Pilotage Act 1987
DETR	Department of the Environment, Transport and the Regions
DWT	Dead Weight Tonnage
FCS	First Corporate Shipping
GHMP	The Gloucester Harbour Management Plan.
GHT	Gloucester Harbour Trustees.
MRM	Manders, Raikes, Marshall.
NRA	National Rivers Authority.
PMSC	Port Marine Safety Code.
PWR	Pilot Watch Radar
SCOP	Steering Committee on Pilotage
SES	Severn Estuary Strategy
SSSIs	Sites of Special Scientific Interest
SACs	Special Areas of Conservation.
SCOSLA	Standing Conference of Severnside Local Authorities
SPAs	Special Protection Areas
STPG	Severn Tidal Power Group
VTS	Vessel Traffic System.
WYEMAG	River Wye Management Advisory Group

CHAPTER 1

ORGANISATION AND CONSTITUTION

W A Stone's History of the Trustees records that in 1966 the constitution of GHT was 21 Trustees from a wide spectrum of interests which recognised the then significance of trade at that time, not only to Sharpness, but also to Gloucester and the Upper Severn.

A period of change began in 1967 for the Pilotage Authority and the Trustees. In July that year an Emergency Meeting of the Trustees discussed the impending Ports reorganisation, which would have involved the abolition of Statutory Harbour Authorities and their proposed replacement in the Severn area by the Regional Wales and Severnside Port Authority. The Trustees objected strongly to the proposals pointing out that a "*National Body would not give as cheap a service, bearing in mind that the Trustees are appointed, and act, in an honorary capacity*".

Although firm action nationally did not begin until the mid 1980s, the Trustees recognised the need for modernisation and appointed a special sub-committee in 1976 under the Chairmanship of Richard Shackleton to submit proposals for the reform of the method of representation. Gloucester and the upper reaches of the River Severn were fast becoming less viable in trading terms, and the concentration of shipping was at Sharpness.

British Waterways held, in effect, eleven nominations for Trustees, four by virtue of their representation on the Pilotage Authority and three strictly relating to Lydney Docks. Some of these were the result of reorganisations within various public bodies such as the organisational changes within the British Transport Commission, which led initially to the break-up of the Docks and Inland Waterways Executive, and later the establishment of the British Waterways Board.

Local Authorities north of Gloucester had by 1976 become less involved in river matters and representation had, in some cases, gone into default - indeed difficulties had arisen in achieving a quorum for the quarterly meetings.

Apart from the British Waterways Board, the principal nominating authorities were the Pilotage Authority and the local authorities adjacent to the Lower Severn area. Gloucester City Council had a particular interest, as custodians of the Port of Gloucester under its Charter of 1580, which gave certain rights and responsibilities. The limits of the Port of Gloucester all lay within the Trustees' jurisdiction and were, therefore, of particular interest to the City.

The emphasis in the future was to be on representation from bodies having a direct interest in the trade and services which were catered for within the particular area; nominees would have the skill and experience necessary to advise on the local matters which come within the remit of the Harbour Authority.

The Trustees had existed for over ninety years as a notionally independent body, but in reality had become a dependent offshoot of the British Waterways Board and, whilst still providing a good and sufficient service as an organisation, needed

reconstitution to enable it to respond more readily to modern navigation and shipping requirements.

However, the economic realities of 1980 were such that it was decided that the limited funds then available were better spent on improved navigation aids. The promotion of this constitutional change would have cost £2,000 and the report of the sub-committee was, therefore, "left on the table". In fact, this valuable effort was not shelved for long, because the Green Paper on Marine Pilotage was published in December 1984. This foreshadowed the abolition of the Pilotage Authority in 1988 when its responsibilities were incorporated into those of the Harbour Trustees.

Since 1968 there had been a recognition at national level that the arrangements for pilotage had not been working satisfactorily, although the situation in Gloucester did appear to belie that conclusion. In 1973 Central Government appointed a Steering Committee on Pilotage, followed in 1977 by the Advisory Committee on Pilotage. The SCOP recommendations as amended by ACOP led to the first substantial pilotage legislation for 66 years - the Merchant Shipping Act 1979 (since incorporated into the Pilotage Acts of 1983 and 1987)

The Pilotage Commission, a mainly advisory body, was established with a limited life, as the Government had come to believe that, under the new arrangements, there would be no long-term advisory or consultative to warrant the retention of such a central representative body. Harbour Authorities were to manage their pilotage services as they saw fit.

Such was the environment in which the Trustees met in January 1985 - the Pilotage Authority had given their blessing to the proposals and the Trustees welcomed them. However, there were reservations. The Trustees had been performing as a Lighthouse Authority and their present constitution and representation were not appropriate to take on the pilotage function. It was now obvious that the present level of representation was far too large and in line with the earlier sub-committee report from Richard Shackleton, should be in the region of twelve members.

The financial burden of incorporating the Pilotage Authority could not be borne solely by the Trustees. For example, the funds necessary to provide a dedicated boarding and landing service or to cover the employment of pilots were not available.

The Trustees responded positively to the Green Paper. However, the financial responsibilities to be placed on the new Competent Harbour Authorities, particularly in its implementation, were considerable and the Trustees needed to be assured that assistance would be available. For example, they would expect any necessary Order amending the constitution to form part of the general legislation promoted by the Government.

The Trustees' records for the years 1985 and 1986 barely reflect the considerable work carried out to consolidate the Trustees' position as a Competent Harbour Authority and the establishment of the substantive financial base that was vital to the success of the changeover. In particular, the backing of the British Waterways Board and the provision of guarantees to underwrite the Trustees' extended role were essential.

A Special Meeting of the Trustees in April 1987 received a detailed report from the Chairman on the plethora of activity that had taken place. Several of these matters, such as those covering finance, pilotage, boarding and landing, will be the subject of later chapters. The proposal to reduce the number of Trustees was resurrected and a Consultation Document prepared for all interested parties.

The Consultation Document envisaged a body of twelve Trustees, four of whom were to be co-opted, together with representatives of ship owners or agents, local authorities, the pilots, the Central Electricity Generating Board and the British Waterways Board; the latter to have the right to appoint the Chairman. The objective of this revised representation was to reflect more directly the interests of those involved in the operation of the harbour.

There was no adverse reaction from those whose representation was historic rather than practical, but co-option was sought if circumstances so dictated. Ship owners and users sought greater representation, which the Trustees accepted by allocating one place to each category. Having in mind Departmental guidelines, the Trustees decided to reduce the number of Trustees to eleven and incorporated only two co-opted members.

The next step was the preparation of a draft Harbour Revision Order incorporating all these matters. The Parliamentary Agents, Dyson, Bell & Co were appointed in July 1987 to act for the Trustees, an association which continues to this day.

After many months of frustrating meetings and correspondence, the Gloucester Harbour Revision Order 1988 was made by the Secretary of State on 29th March 1988. This was a significant milestone in the history of the Trustees - a new streamlined authority with adequate financial backing and redefined limits of operation and jurisdiction.

The new constitution date was 14th April 1988 and on the following day the new Trustees met for the first time. Assembled around the table for this inaugural meeting were:-

British Waterways Board	- Ian Walker, John Collins and Mike Vale
Central Electricity Generating Board	- William Hannah
General Council of British Shipping /and Incorporated Council of Shipbrokers	- Edward Renshaw
Amalgamated Gloucester Pilots	- George Woollard
Gloucestershire County Council	- Paul Fountain
Gloucester City Council	- Richard Shackleton
Stroud District Council	- Dennis Collins

The Officers attending were:-

Clerk	- K Biddle
Treasurer	- Howard Baker
Hon. Engineer	- Roger House
Hon. Harbourmaster	- Capt. Allan Boyack
Receiver and Collector	- Alec Thomson

Ian Walker became Chairman and Richard Shackleton, Vice-Chairman. Ron Pointer and Peter Clements were appointed as independent Trustees having a distinct interest and a knowledge of the Harbour and the work of the Trustees.

Thus a new era was born. One body had been created to replace both the former Pilotage Authority and Harbour Trustees, with eleven Trustees all having a close interest in the harbour replacing the original twenty-one with their varying historical backgrounds.

The redefinition of the Harbour limits extended the jurisdiction of the Trustees more exactly to the tidal limits of the estuary. The seaward limit remained from the Welsh shore at Redwick in the County of Gwent, due south to the limits of the Port of Bristol, thence northward to Denny Island and thence to the English shore just south of Severn Beach. The inward limits moved upstream on the River Severn to the weirs at Maisemore and Llanthony, and on the River Wye, the limit was confirmed at Bigsweir Bridge.

Succeeding years produced new problems, innovations and challenges - the building of a Second Severn Crossing, the emergence of radar as an improved navigational aid, and the need to meet the conflicting aims of both commercial and leisure craft on both the Severn and Wye with the consequential environmental impact. During this time, the British Waterways Board made a conscious decision to distance themselves from direct involvement in estuarial matters. Having provided the support to launch the new organisation, British Waterways gradually withdrew to their core business of inland navigation. In 1988 Ian Walker left British Waterways, but was appointed by the Trustees to fill one of the then vacant independent Trusteeships. He continued as Chairman.

Experience gained in the early years of the new body necessitated two more Harbour Revision Orders in 1990 and 1994, increasing the maximum number of Trustees to thirteen, by adding a representative of yachting interests appointed by the Royal Yachting Association. The 1994 Order also improved the flexibility of the Trustees in the management of the harbour and its administrative machinery, conferring new general powers relating to byelaws, dredging, the provision of navigation aids, licensing works and substituting provisions in place of those of the Commissioners Clauses Act 1847.

Throughout the latter Sixties and during this exciting period of reconstruction, the Trustees were served by only two Chairmen, Geoffrey Clayton and Ian Walker, a continuity which was of great value in producing a smooth transition.

However, since 1966 the membership had varied considerably, with local authority elections, movement in the ranks of British Waterways and constant changes in the commercial field, which undoubtedly led to the revised Board of Trustees in 1988.

However, throughout both the time of the old and of the new body, the names of many people who have given service to the Trustees stand out :

- Roger House who for 27 years was first a Trustee and later the Honorary Engineer with responsibility for liaison during the construction of the Second Severn Crossing
- Peter Clements, formerly of Bowker and King, who after retirement was prevailed upon to continue with the Trustees and provide the benefit of a lifetime spent on the river

- Alderman Keith Fisher who initially provided the link with Gloucester City
- Richard Shackleton, former Chief Executive of Gloucester City, who continued that link first as Vice-Chairman for 11 years to 1990 and then, on his retirement, succeeding Dennis Collins as Clerk in 1996
- Councillor Basil Booth, latterly Vice-Chairman, who returned to the Trustees in 1993 after an 8 year absence
- Captain Allan Boyack as both Trustee and Honorary Harbourmaster
- the contribution of the Pilots' representatives to the evolution of the Trustees, Les Spiers, Ron Morgan, Brian Richards, George Woollard and latterly Keith Hadley

In this history there must also be a special place for the two Chairmen, Geoffrey Clayton and Ian Walker, both of whom devoted considerable energy to the work of the Trustees, not only at local level but also on the national scene. Long serving Chairmen seem to be a tradition of the Trustees. Geoffrey Clayton retired after 24 years in post and Ian Walker is in his 21st year.

Geoffrey Clayton's work as a member of the Advisory Committee on Pilotage and on the Council of the UK Association of Pilotage Authorities contributed much to the way in which pilotage eventually evolved nationally. He also oversaw the construction of the first Severn Bridge and the Wye Bridge, laying the foundations for the work that was ably promoted and managed by Ian Walker relating to the Second Severn Crossing. Geoffrey Clayton's clarity of purpose kept the Trustees and the Pilotage Authority independent and solvent. In the years after his retirement in 1979 the Trustees benefited from his legacy of sound management.

His successor, Ian Walker, with his drive and unrivalled knowledge of the Estuary, has been able to build on these sound foundations. The involvement in national policy continued with the election of Ian Walker to the Council of the British Ports Authority in 1996.

The Harbour Revision Order 1994 revised the constitution of the Trustees, when the RYA, represented by George Clark, became a full member. The newly constituted authority first met in June 1996, with Ian Walker continuing as Chairman and Basil Booth becoming Vice Chairman.

Succeeding years saw several changes in the membership of the Trustees. Some arose as a result of retirements from professional occupations, some from developments in the Estuary.

In 1996 BWB began to explore the possibilities of placing the future of Sharpness in private hands, a move which initially gave the Trustees some cause for concern. However, BWB confirmed their firm intention that Sharpness would be maintained as a commercial port, and the significant investment in the estuary made by the

Trustees in safeguarding estuarial navigation would not, therefore, be wasted. In January 1997 Sharpness Docks Ltd, a wholly owned subsidiary of Victoria Wharf Ltd of Plymouth, became the new owner of Sharpness Docks. Its Managing Director, Mark Gatehouse, became a Trustee in that year, succeeding Mike Vale.

The importance of the Severn Crossings in the maintenance of safe navigation in the Estuary was recognised by the appointment in December 1997 of David Foice, the General Manager of Severn River Crossing plc, as a co-opted Trustee.

After many years of discussions draft byelaws were eventually placed in the hands of the Trustees' Parliamentary Agents, Dyson Bell Martin, in early 1995. They were still a subject of much concern to recreational bodies, in particular those associated with water ski-ing, and in September 1995 the Trustees arranged a meeting at Chepstow of all users and other bodies associated with the Severn Estuary.

It became increasingly obvious that considerable difficulties would be encountered in attempting to meet the competing requirements of the various organisations and also the interests of those living on the river shoreline, particularly with regard to speed limits. This prompted the formation of a User Forum, which met for the first time on 29 May 1997, and since then at six-monthly intervals. In 1998 over ninety organisations were invited to its meetings.

The Byelaws were submitted to the Secretary of State in July 1997, but their confirmation was still a long way off. The Secretary of State required modifications regarding vessel speeds and water skiing, all of which involved further consultation periods. Eventually, in September 1998 the Trustees, whilst not being wholly satisfied with the modifications, resubmitted the amended Byelaws to the Secretary of State as the only realistic way forward. The Byelaws were confirmed in October 1998, with the requirement for a common code of practice, which was completed after consultation with the British Water Ski Federation. A copy of the Byelaws is available on the Trustees' web site.

In September 1998 Captain Allan Boyack retired after eighteen years as a Trustee and Honorary Harbour Master to the Trustees, but his association with the Trustees did not end there. The Government had commissioned a review of the Pilotage Act 1987 following the grounding of the Sea Empress. The DETR published its main findings in July 1998 and it became apparent that Captain Boyack's expertise would be invaluable in the transition to any revised structure. He was, therefore, appointed as Marine Advisor until September 1999.

A period of change is again on the way with the need to implement the Trust Port Review and Port Marine Safety Code. In comparison with 1961, GHT in 2000 is now an independent body no longer dependent on British Waterways for engineering and managerial expertise; the Trustees have a modern constitution consequent on the Harbour Revision Orders of 1988 and 1994; Byelaws are in operation; Pilotage Directions have been revised and General Directions made; a Gloucester Harbour Management Plan has been approved; internal documentation has been improved to QA standard; and compliance with the Port Marine Safety Code is well under way.

CHAPTER 2

SPANNING THE SEVERN ESTUARY

On 24 July 1986 Hansard records the statement from the Secretary of State for Wales that "*the Secretary of State for Transport and I have considered the consultants' findings and have decided that a second Severn crossing should be provided. We propose that the new crossing should be a bridge sited at the English Stones, about 3 miles downstream of the existing crossing.*"

This announcement followed a programme of strengthening and repair for the first crossing and the production of a consultant's report, to all of which the Trustees provided an input.

The first crossing had not been out of the news. There had been constant reports of lack of adequate navigational lighting, which greatly concerned the pilots, but the most serious hazard remained the consequences of total loss of visible navigation aids.

Although the advent of the Second Crossing was seen to present the Trustees with an opportunity for the significant improvement and development of the navigation aids, this was linked with concern at the proximity of the bridge to a turning point for shipping where tidal velocities are strong. Indeed, visitors to the consultation exhibition expressed worries that a combination of tidal conditions and poor visibility, coupled with the location of the proposed bridge piers, could provide a serious hazard to navigation. Indeed, one of the many major problems foreseen by GHT was ship speed downstream which, for a vessel leaving Sharpness on the limit of the tidal window on a spring tide, could mean an aggregate speed over the ground of up to 20 knots at the entry into the Shoots Channel.

The viability of Sharpness as a significant inland port was now at risk. This was not only because of potentially perilous navigation, but also the need to maintain air clearance of 37 metres from Mean High Water Spring Tide to the underside of the bridge. This would ensure that the size of ship permitted to pass under the bridge did not inhibit future development of Northwick Roadstead, or the use of Sharpness by larger vessels. Subsequent events, such as privatisation and the trend towards larger vessels using Sharpness, provided adequate justification for the significant expenditure necessary to safeguard commercial navigation.

Such was the scenario in which a comparatively small Harbour Authority had to ensure the survival of commercial navigation, which had continued unimpeded on the Severn Estuary certainly since Roman times and possibly before, against the determination of Central Government to achieve a new national road link across the Estuary.

At the initial meeting with the Transport Department, the Trustees, represented by Chairman, Ian Walker and Consultant, Bill Finlayson (MRM), took a firm stance and stated that, although no objection would be raised to the Crossing, the prime consideration must be the safety of navigation. In fact, an excellent rapport was established with Brian Blaxall of the Estuarial and Toller Crossings Division of the Department, and the Trustees also had the benefit of support from the Marine Directorate in ensuring continued navigational safety.

The provision of a good system of vessel traffic management, preferably using a radar surveillance system, together with the relocation and enhancement of navigational aids, was identified as a prerequisite to maintaining not only safe navigation but also ensuring a safe location for the Crossing itself.

The satisfactory outcome can be attributed to the early involvement of the Trustees, the use of professional expertise and the acknowledgement by all parties that the respective sizes of the organisations involved had nothing whatsoever to do with the progression of the project.

Three years of negotiations and studies followed, which ensured that the agreements reached and undertakings given were fair and equitable to all the interests concerned. Throughout the negotiations the Trustees were ably guided by their Parliamentary Agents, Dyson Bell Martin and, in particular, Paul Thompson.

To detail the extent and complexity of the various meetings would produce a book on its own. However, the importance of such discussions can be illustrated by the near conflict reached on the floor of the House of Commons over the issue of permitted vessel tonnages. The 'Final Study Report' by W.S. Atkins and Maunsells into the Second Crossing said that "*an examination of the shipping records for the Severn Estuary shows that vessels of up to 6500 DWT pass through the Study area*", that being the criteria for assessing ship impact on bridge piers.

Early meetings with the Department of Transport stressed the development of ship sizes, because larger ships were visiting Sharpness. In the five years to 1988 the average vessel size had doubled and vessels up to 10,000 DWT had been received by the port. Ships up to 25,000 DWT could reach Northwick Roadstead, an area ripe for estuarial development in the event of the proposals for the construction of a tidal barrage coming to fruition. The Trustees were insistent that a 25,000 DWT standard had to be met for Northwick Roadstead, which inherently would cover a 10,000 DWT standard for Sharpness, as far as the bridge location and pier design was concerned.

In December 1989 the Department confirmed their stance that the bridge should be designed to withstand impact from vessels up to 6,500 summer DWT, but that the attention of tenderers would be drawn to the occasional use by vessels up to 10,000 DWT. The Department reiterated that there were no firm plans for vessels up to 25,000 DWT to use Northwick Roadstead and the mere likelihood could not justify the considerable additional costs, running into many millions of pounds, of the extra ship protection measures which would be required.

The negotiations addressed navigationally complex issues involving air draft and the relativity of global warming, the implications of "ice-strengthened" vessels, and potential development in the Estuary. Throughout, the Trustees had one objective - to protect the current and future role of the Severn Estuary as a major route for commercial shipping.

As 1990 approached, it became increasingly apparent that the Trustees should prepare not only themselves, but also those other authorities who were at risk, to oppose any provision in the Enabling Bill by which the Department sought powers to limit the size of ships which could enter the Harbour. Local authorities, the British Waterways Board, and Members of Parliament were alerted to the implications for the Estuary. However, the costs of objection were high and compromise was the aim. The Trustees concluded that they should accept a limitation on the size of

shipping to 10,000 DWT to Sharpness, but on the understanding that, if and when the Barrage was built, they would wish this limitation to be raised to 25,000 DWT. Until this limit was raised, ship movements between 6,500 and 10,000 DWT should be subject to advice on such movements being given to the bridge concessionaires by either the Duty Pilot or the Harbour Master.

The phrase "much water passed under the bridge" is not perhaps pertinent in this case but certainly during the next twelve months much activity, ably backed by Roger Knapman, the MP for Stroud, produced assurances in the House by the Secretary of State for Transport that *"the Bill does not attempt to frustrate any shipping currently using the River Severn" and "its design and operation....must facilitate both existing trade and, where sensible, increases in the size of ships"*. Though guarded, at least these comments did not prejudice the existing situation.

The Trustees extracted an Undertaking from the Secretary of State which, in consideration of the Trustees refraining from opposition to the Severn Bridges Bill, gave cautious guarantees regarding his "present intentions" to regulate or restrict navigation in the Harbour, together with agreement to review any restrictions in the event of operational experience or developments such as a tidal barrage, amongst other things.

The extraction of such assurances, however cautiously worded, provided a safeguard that future Governments will find it difficult to constrain estuarial commercial navigation improvements and will ensure the future of Sharpness as a viable port.

Not only was it important to protect the bridge from errant ships, it was also necessary to protect ships, as the bridge piers were not designed to withstand impact. The bridge concessionaire was responsible for the construction of ship protection islands, but following detailed research on ship simulation and risk analysis together with practical experimentation in the estuary, it was decided that a more satisfactory solution would be the improvement of the existing navigational aids and the introduction of new ones.

Once again, the problems experienced by outward bound vessels were highlighted and the opportunity was taken to improve on-board vessel measures through the development of Pilot Watch Radar (PWR). The installation of a radar surveillance system had already been highlighted as an essential part of a good system of vessel traffic management.

Very early in the discussions with the Department of Transport it became evident that not only would the bridge pose a serious restriction on the width of channel available to shipping, but it would also prevent pilots availing themselves of the comfort, in bad weather, of calling on Avonmouth VTS station to obtain a broad idea of their position using the Avonmouth Radar. The Trustees, with the help of the Marine Division of the Department, persuaded the Department Roads Division that this was a real problem and dB Electronics Ltd were commissioned to carry out a development project from which PWR evolved.

The technical detail of the system is admirably explained in a paper presented in 1994 by Ian Walker (Chairman, Gloucester Harbour Trustees) and Dr. William Mullarkey (Managing Director, dB Electronics) to the Permanent International Association of Navigation Congress in Seville. It basically relies on the system's ability to process and compress the output from the shore radar stations and

transmit the signal over standard VHF links to portable receivers carried by the pilots on board ships in passage. The same technology allows remote control and monitoring to be carried out at Sharpness.

The Department of Transport and the Trustees appointed Commander Peter Bell, as the designer and supervisor of a series of trials on the River Tay, to evaluate the hand-held, portable, battery powered equipment evolved to allow pilots to effectively navigate a vessel "blind". In March 1991 four GHT pilots, surrounded by a plethora of technical observers, took part in the trials. One at a time, they sat in a cabin with no outside view of what was happening and passed verbal helm and engine movement orders to the coxswain on the bridge. Suffice to say, the trials were a success.

A contract was placed for a complete system for the River Severn, which would provide the pilots with a navigational system totally independent of that on the boarded vessel. This system would allow a pilot to fix his position relative to other river traffic and to fixed navigational obstacles. These objectives were met by providing each pilot with a portable radar receiver capable of displaying images being broadcast to all pilots on board ships from shore-based fixed radar stations.

Initially, two fixed radar stations were provided: one at Severn Beach on the English side and one at Black Rock on the Welsh side of the Estuary, with the engineering station, which included two complete radar displays and all their controls, located remotely at Sharpness.

The research into changes in the measures for ship protection showed that, although the two radar stations provided good radar cover of the area seaward of the Second Severn Crossing and between the two crossings, coverage of the area upstream of the first bridge was poor. This caused problems for outward bound vessels when setting a course to pass between the two main supports of the second crossing. Therefore, a third radar station was placed at the White House, Shepperdine, a spot well known as the home of the late Percy Palmer, a former employee of the Trustees, and radar coverage is now complete from the southern boundary of the Harbour through to and above Inward Rocks. The PWR receivers were upgraded at the same time to give the pilots far more information and virtually the same display on the ship's bridge as would a VTS operation ashore. These changes were included in a Concession Change granted by the Government to eliminate the need for ship protection islands

However, all was not plain sailing. Problems arose over the maintenance of the system and, as a result, the Trustees commissioned a Technical Audit by Robert Barnes & Co. which highlighted the need for the Trustees to take direct control and employ a technician capable of undertaking the maintenance of the system.

In January 1997 Mike Johnson was appointed as Technical Officer. His duties related to the technical aspects of maintaining and operating the various navigational aids, which encompassed most of the work previously undertaken by the Hon. Engineer, and the opportunity, therefore, arose for Roger House to retire after twenty-two years' service with the Trustees. The Technical Officer post, initially funded wholly by the Highways Agency and Severn River Crossing plc, was enhanced to that of Marine Officer in September 1998, widening the duties to include operational conservancy matters arising from the new Byelaws, together with work in relation to the new environmental responsibilities placed on the Authority and the non-statutory responsibilities of the Duty Harbour Master.

This chapter would not be complete without reference to the enhancement and addition of static navigational aids evolving from the construction of the second crossing.

The immediate needs, prior to the construction of the new crossing starting in 1992, were to provide substantial upstream and downstream gateway marks to highlight the position of the main span; to indicate clearly the Old Man's Head; to provide platforms for visual and electronic marks and to provide a marking of the new leading line for downstream traffic between Chapel Rock and the head of the Shoots Channel.

Four new beacons, designed by MRM Consultants, were constructed by Hydrocore Ltd and placed at Mixoms, Lower Shoots, Lady Bench and Old Man's Head during a period of ten weeks in 1991 at a cost of £870,000. The design and construction won the British Construction Industry Award for Small Projects in 1992.

The new routing established as a result of extensive ship simulation tests carried out by H R Mardyn at Llantrisant, again involving Gloucester Pilots, developed new passage alignments into and within the Shoots Channel, where it passes under the main span of the new bridge, and in the channel upstream.

To sum up the achievements of the Gloucester Harbour Trustees in the saga of the Second Severn Crossing: this small body was able to influence Government thinking on the siting of the new crossing; was able to safeguard navigation interests and to protect the future of Sharpness as a viable port operation. As a result, the Government was able to build a bridge crossing, rather than the alternative of a tunnel, saving £200 million in capital cost. Furthermore, substantial savings in the construction and maintenance costs of the Second Severn Crossing were generated as a result of the new navigation aids.

The successful construction of the Crossing is not the end of the story. The navigation channel at the Crossing was restricted to 450 metres, so the on-going maintenance and enhancement of navigation aids was a prerequisite of the bridge agreement. Agreement based on an exchange of correspondence was reached in 1996 between Severn River Crossing plc, the company formed to maintain and manage the two bridges during the Concession period, and the Trustees.

However, it took until September 1999 to complete the formal documentation. Under this Agreement, the company are responsible for 100% of the costs of the Northwick Buoy and 33¹/₃% of the costs of the Pilot Watch Radar System, with the Highways Agency being responsible for the balance of the PWR costs and 100% of the costs of the Shoots Beacons and other relevant navigation aids.

The Trustees have emerged as a stronger and more secure organisation. As a result of significant Government infrastructure investment in the Estuary in new and improved navigation aids, the Trustees have ensured safe navigation for vessels within the harbour and have played an enterprising role in the development of a major navigation aid, Pilot Watch Radar.

CHAPTER 3

PILOTAGE

Prior to September 1988 responsibility for maintaining a pilotage service on the Upper Severn Estuary was vested in the Gloucester Pilotage Authority, set up in 1861 pursuant to the Bristol Channel Pilotage Act. In 1988 responsibility passed to the Gloucester Harbour Trustees, which became a Competent Harbour Authority under the Pilotage Act 1987.

Stone's History refers to the reconstitution of the Pilotage Board in 1921 as the Gloucester Pilotage Authority. This was a statutory body with powers to licence pilots and was required to meet requests for pilotage to and from the ports of Gloucester, Sharpness, Chepstow and Lydney, within the Gloucester Pilotage District. In 1966 this stretched from Sharpness to the meridian of Lundy Island. Pilotage was compulsory east of the Compulsory Pilotage Line, running between Gold Cliff (on the Welsh side) and Clevedon Pier (on the English side), for all vessels other than those specifically exempted by the Pilotage Act 1913 and by Gloucester Pilotage Authority Byelaws.

It is impossible to describe adequately the hazards of pilotage in the Estuary. It is a strange area of mud flats and rocks and sand banks, ebbing pools and water channels, perhaps best explained by former Pilot Ron Morgan, who saw many changes in his forty years as a pilot. His years of service stretched from the days when watch, compass and lead line were used, pilots navigated from echoes off the cliffs to determine a ship's position and several tides were needed to pilot a ship to Sharpness, to an era of solar powered navigation lights, radar and satellite navigation systems, and a six hour act of pilotage to Sharpness. To quote Ron, "There is only one River Severn, and it is unique".

In 1966 nine pilots were operating on the river and 996 vessels were piloted with a net tonnage of 263,182. (Appendix B lists the names of those pilots who have been licensed by the Authority from 1966 to date.) Pilots were not directly employed by the Authority but worked together under a legal agreement and had their own cutter company, the Gloucestershire Pilots Cutter Company, formed in 1912.

The Pilotage Authority appointed Miss Hacker as Pilotage Agent in October 1970. Her duties were to organise the availability of pilots, levy pilotage charges, make payments to the pilots and remit the residue to the Pilotage Authority to cover administrative costs. Miss Hacker, who retired in 1974, was followed by Mr Gilhooly until 1978, when Miss Hacker resumed for a further twelve-month period, during which the duties were reviewed and the operational aspects transferred to a Duty Pilot system. In May 1981 the duties of the post were taken into British Waterways offices at Gloucester on an agency basis and Mr A S Thomson then acted as the Authority's Receiver and Collector for over seventeen years.

In 1973 it became apparent that the Gloucestershire Pilot Cutter Company was in a parlous state, being subsidised by the Pilots. The Company then commenced negotiations, without reference to Gloucester Pilotage Authority, for the surrender of their cutter to the Bristol Pilotage Committee. Meetings were held in December 1973 and January 1974 between representatives of the Bristol Pilotage Committee and Gloucester Pilotage Authority to agree on the way in which a cutter service could be provided by the Bristol Authority from Portishead (known as the Eastern Station) for the benefit of the pilots of both authorities.

Under these proposals, the Bristol Pilotage Authority, having assumed the entire responsibility for the boarding and clearing of Gloucester Pilots from King Road to Walton Bay, would receive in full the boarding and landing fees for ships boarded and cleared by them, and would take over all the assets and liabilities of the existing Gloucestershire Pilot Boat Company. Any initial operating difficulties arising out of the joint boat service would be ironed out by a co-ordinating committee.

This appeared to be an advantageous arrangement to both parties. Pilots for vessels requiring pilotage only within the compulsory area boarded and disembarked from the vessels at Walton Bay using the pilot cutter shared with Bristol Pilotage Authority, operating from Portishead. Pilots for vessels requiring pilotage all the way from Breaksea would continue to use the pilot cutter service of the South Wales Pilotage Authority based at Barry.

In April 1974 the Gloucester pilots amalgamated their service with that of Bristol. This was a loose arrangement with no formal agreement. At that time, about two-thirds of the Acts of Pilotage for the Gloucester Authority were being executed from the Eastern (Avonmouth) Station and the remaining one-third from the Barry Station of the South East Wales Pilotage Authority.

However, trade in the Bristol Channel fell after the amalgamation, which resulted in the Gloucester use of the Eastern Station falling far below expectations with an even greater fall in Bristol's use of this facility. In March 1980 the overall proportion of Gloucester Acts of Pilotage was 20% from the Eastern Station with the other 80% from Barry.

In April 1975 Bristol announced their intention to cease boarding and landing at Avonmouth (Portishead - Eastern Station). This was a serious blow, only some two years after the amalgamation, and strong objections were, therefore, raised. Gloucester pilots were now without a service at Avonmouth, where they still boarded a significant number of vessels, and were faced with either moving all activities to Barry or starting up their own cutter service once again. The latter option was a non-starter for both financial and practical reasons.

Fortunately, the South East Wales Authority were able and willing to extend their boarding and landing service to embrace all Gloucester activities and to accommodate the pilots at their lodge at Barry. However, the change was not without its problems; a need for additional pilots was forecast with consequent increased costs and, in the pilots' opinion, the Compulsory Line needed to be moved to Barry.

The Gloucester Authority ultimately looked towards the provision of an independent boat service to serve the three authorities of Bristol, Gloucester and South East Wales. The main hurdle, however, was the substantial cost of re-equipping the then ageing pilot boats being run by both Bristol and South East Wales.

The Gloucester Authority formally objected to the closure of the Eastern Station, being joined in their objections by the British Waterways Board and the Sharpness Users Association. A series of meetings and discussions took place which eventually culminated in a meeting on 6 June 1980 between the three authorities chaired by a representative of the Department of Trade. Three options were open to Gloucester; to take over the Eastern Station from Bristol; to board through South East Wales' facilities at Barry; or to board through Bristol Pilotage Authority's facilities at Breaksea (the Western Station).

The way forward was by no means clear. There was no doubt that the Eastern Station was uneconomic to run and was under-utilised. However, to reverse the trend towards the use of Barry would take time, during which the losses would continue. This was a burden Gloucester could not carry. Inherent in any decision was the need for Bristol to move their Compulsory Pilotage Line.

The financial advantages of using the South East Wales Pilotage Service for all Gloucester ships could well prove to be short-lived, as it was subject to commercial pressures by the British Transport Docks Board. It would also put the Gloucester Pilotage Service beyond the immediate control of its parent body. Equally, that control would be lost if the entire use passed into Bristol hands.

The Gloucester Pilotage Authority declared its policy of opposing any changes until it was possible to reach an agreement between the three authorities on the establishment of a jointly run boarding and landing service for all the pilots licensed by the three authorities.

The intention was to have an independent service set up in such a way that none of the commercial interests could interfere with the fixing of charges. It would also include suitable safeguards to prevent smaller ships being deterred from using any of the Docks, but more particularly Sharpness and Chepstow, by the imposition of excessive pilotage charges. A new short term arrangement was then the immediate objective, enabling the three authorities to establish realistic long-term boarding and landing arrangements, which would have due regard to both economic and operational requirements.

Yet another watershed had been reached in the life of Sharpness Docks. If pilotage charges became too expensive within the Port of Gloucester, the docks would die commercially; but at the same time the Gloucester Pilotage Authority could not be seen to be unnecessarily obstructive. Developments in pilotage were pending at national level and the new Pilotage Commission would not take kindly to such action and, in such circumstances, the larger Authorities could well benefit.

Meanwhile in March 1982, the Gloucester Pilotage Authority and the South East Wales Authority concluded an agreement to "*provide facilities and accommodation at or out of Barry in respect of its (Gloucester) Pilots boarding and landing*" using cutters owned by the Welsh Authority.

The tenuous position of the Gloucester Authority as the junior participant in any discussions and the need for both moral support and financial backing is nowhere more apparent than in a letter dated March 1982 from Ian Walker, its Chairman, to David McCance the General Manager of the British Waterways Board (the owners of Sharpness Docks). It summarised submissions to BWB from 1980 onwards, the background to the various options and the apparent reluctance of BWB to recognise the need to provide substantial guarantees for the provision of an independent

Eastern Station. It appears that in discussions BWB's representative had made clear his feeling that the Gloucester Pilotage Authority should have a "*real stake in any future joint service*".

However, there needed to be a formal resolution by BWB agreeing to guarantee the future commercial performance of the Port of Gloucester, at or above the then present levels. The Chairman in his letter reiterated that the Authority would

" prefer any investment in a Boarding and Landing Service to be on a thoroughly economic, and above all, sound operational basis. We have not been persuaded by any representations made to us that such an investment could be in other than a joint service with Bristol and South East Wales operating from Barry and that investment in an Eastern station operating for the sole use of ships bound for the Port of Gloucester is uneconomic. The Authority believe that the best interests of the Port - both short and long term - will best be served by rationalising the present Boarding and Landing arrangements and by this Authority taking a lead in such rationalisation so that we can, although we will always be a junior partner, hold the balance of power in such a service."

Thus BWB's involvement was crucial to the future of the Port and its backing for the Authority's actions essential.

In April 1982 the Gloucester Pilotage Authority issued a Statement of Policy on the closure of the Eastern Station. It outlined the following points of significance:

- the total volume of traffic in the Channel was only sufficient to sustain one Boarding and Landing Service and the base for such a service could only be at Barry;
- the majority of Gloucester's traffic was served from Barry and the retention or operation of the Eastern Station was not justifiable;
- the Authority's objections to the closure of the Eastern Station could not be sustained on either operational or financial grounds.

The retention of the Eastern Station was said to be a major obstacle to rationalising the Boarding and Landing Services of the three Authorities. Advice given by the Department of Trade and the Pilotage Commission permitted the Authority, within its then Byelaws and Order, to service its present Compulsory Line from the Western Station at Barry.

The Authority, therefore, resolved at its meeting on 26th March 1982 that, subject to the conclusion of a satisfactory agreement with the Bristol Pilotage Authority, no objections would be made by the Gloucester Pilotage Authority to the closure of the joint boarding and landing service on or after 1st September 1982.

In October 1982 it was reported that there had been failure to make real progress in the negotiations between the three Authorities on the provision of a joint boat service and Captain Boyack, the Honorary Harbour Master, was requested to liaise with his opposite numbers at Bristol and Newport to review urgently all information available with a target date of January 1984 for the commencement of the service.

The Eastern station closed on 31st December 1982 and in March 1983 the Trustees received a report that all traffic was now served out of Barry (Western Station).

The closure of the Eastern Station did not receive universal approval. Some Port users objected, on the grounds of cost and loss of control of pilotage to their commercial rivals, the South East Wales Ports. They argued their interests would be better served by keeping an English Boarding and Landing Service. The Guildhall in Gloucester was the venue for an acrimonious meeting at which the views of all objectors were heard.

Following this, the Gloucester Pilotage Authority asked Coopers and Lybrands Associates to examine the financial and other implications of the various ways of meeting the Authority's Boarding and Landing requirements. The report was presented in January 1984.

The report itself is of historical significance because it brings together a variety of facts relating to the trade and status of Sharpness during the years 1973 to 1982. During this period its throughput grew rapidly, generally in line with that of smaller ports, and the decline in the trade of larger ports due to the loss of traditional cargoes and lower charges. However, the increase in vessel capacities produced a decline in the annual number of pilotage acts.

After a detailed examination of all the options Coopers and Lybrand concluded that *"assuming, therefore, that a B & L Service shared with SEWPA continues to be available, and that the charges for that service continue to be reasonable, to set up an independent boarding and landing service would be against the interests of a growing majority of port users.....we therefore recommend that the present method of providing boarding and landing be continued."*

At a meeting in February 1984 the conclusions in the report were adopted by the Gloucester Pilotage Authority together with a commitment to *"pursue vigorously the negotiations with the Bristol and South East Wales Authorities, towards the provision of a joint Boarding and Landing Service at the present Western Station."*

However, another factor entered the equation at this time - the Consultative Document on Marine Pilotage. The whole future of pilotage administration was in question. The administrative aspects are dealt with in Chapter 1 and the financial implications in Chapter 5. Suffice to say here that the uncertainty as to the outcome, particularly in relation to responsibility for pilotage, not clarified until the Pilotage Act 1987 was enacted, delayed settlement of many outstanding issues. At this time, the Authority's members, particularly the Chairman, Ian Walker, were committed at national level in the debate to protect the position of small ports in general and Sharpness in particular.

For over six years the minutes of a succession of Trustees' and Pilotage Authority meetings record slow, tedious and frustrating discussions on the provision of a tripartite boarding and landing service. Little or no progress was achieved. A special meeting of the Pilotage Authority in January 1986 considered proposals put forward by the City of Bristol, including the Memorandum of Association and Articles of Association for a proposed new pilot boat company. Furthermore, in June 1986 the Chairman was given approval to sign a "Letter of Intent". Problems on the South Wales side delayed matters once again and, after considering the options available, the Authority agreed that, if a tripartite agreement could not be achieved, then the Chairman should enter into "meaningful discussions" with the Port of Bristol on a dual boarding and landing arrangement.

Later that year the South East Wales Authority stated that they were not prepared at that moment to proceed with the joint boat service, which to a large extent aborted many years of negotiations. The "English" solution was revived, but it readily became apparent that Barry was the only satisfactory point for a one-station service, although Bristol did not have, at that time, any proper security of tenure for their boarding and landing facilities at Barry.

With the advent of the Pilotage Act 1987, Associated British Ports became the

authority responsible for pilotage to the South Wales Ports. ABP decided to reorganise its pilot cutter service and board and land only at high tide. The Gloucester pilots, because of the distance between Barry Roads and Sharpness, needed to board early and be disembarked late in the high tide cycle and a revised service offered by ABP did not cater for this. Thus the discussions with Bristol on a dual service had added importance and impetus.

Initial proposals were formulated in November 1987. These depended upon an evaluation of the financial consequences and the procurement by Bristol of an agreement with ABP for full rights of tenure and access to the quay and their premises at Barry on a long term basis.

In November 1988 both authorities reached agreement on the proposals for the new service, which centred on the use of a new Pilot Boat which had recently been ordered by Bristol and was due to arrive on station some time during December 1988.

Bristol City Council and Gloucester Harbour Trustees set up the Bristol and Gloucester Pilot Boat Company, which was incorporated on 10 January 1989. Bristol City Council financed the purchase of the new purpose-built cutter under a leasing arrangement which met the regulations then in force. This cutter cost in the region of £750,00 and was sub-leased to the Boat Company. Each Authority held forty £1 shares and appointed two directors. The cost of providing the service was apportioned between the two authorities according to usage, with Bristol being the major contributor. Provision was made for other Competent Harbour Authorities (for example ABP) to join at a later date if they wished to participate. The Chairman of the Trustees, Ian Walker, and Richard Shackleton were appointed as the first Gloucester Directors of the Company .

On Tuesday 4 April 1989 the new Pilot Cutter sailed proudly into Gloucester Docks. The "Robina Fisk", named after the wife of the Chairman of the Bristol Conservancy and Pilotage Committee, Councillor Jack Fisk, had an aluminium hull and was built in Sweden for all-weather year-round operation in the Bristol Channel with a crew of two. Ian Walker welcomed civic dignitaries from Gloucestershire County Council, Gloucester City Council and Stroud District Council, representatives from British Waterways and Shipping Agents and their customers, who had all been invited to view the vessel

However, circumstances dictated that only two years later change was on the way again when, on 27 August 1991, Bristol City Council sold out its interests in the Royal Portbury and Avonmouth Docks to First Corporate Shipping Ltd. For the next two years Bristol City Council remained the Harbour Authority with FCS (First Corporate Shipping) acting as their agents and employing the pilot crews.

The Port of Bristol Harbour Revision Order 1993 rectified this anomaly, and an exchange of letters reaffirmed the immunity from "*rates, dues tolls or charges*" enjoyed by Gloucester's traffic in transit through Bristol's Severn Estuary Harbour limits as set out in a 1972 Order. They also confirmed that The Bristol Port Company (FCS) would continue the long established practice of recognising Gloucester's properly issued pilots' licences and pilotage exemption certificates subject to compliance with Bristol's Pilotage Directions.

Inherent in the 1993 Order was the requirement for Bristol City Council to transfer its shares in the Bristol and Gloucester Pilot Boat Company to FCS. The Articles of the

Pilot Boat Company provided that, if one member (e.g. Bristol City) wished to dispose of its shares, it must first offer them to any other member (e.g. Gloucester Harbour Authority). At its meeting in December 1993 the Gloucester Trustees agreed to waive their rights to purchase the shares held by Bristol City Council, thus allowing their transfer to FCS.

The scene was, therefore, set for an Extraordinary General Meeting of the Pilot Boat Company on 11 February 1994 at the Mount Sorrel Hotel, Barry, when the formal procedures were approved. This ended the long-standing relationship with Bristol City Council and, on a more personal note, the involvement of Councillor Jack Fisk of Bristol in Harbour affairs. Commander Bradley remained as a Director, to be joined on behalf of FCS by Brian Tufton; Ian Walker and Dennis Collins continued as the GHT Directors; Howard Baker remained Treasurer and Richard Harvey of FCS replaced Bryan Pitt as Company Secretary.

The emergence of a private company on the scene prompted a reappraisal of outstanding issues. These included the purchase and funding of a replacement Pilot Boat, a review of the fees and charges structure and, most significantly, the future of the Pilot Boat Company itself.

On 1 July another era came to an end when Lt. Commander Joe Bradley stood down as Bristol Haven Master. However, the good working relationship always enjoyed with Joe Bradley continued happily with his successor, Captain Niels Westberg, who also took his place as a Pilot Company Director.

Later in 1994 the Directors considered the relevance of the Company in the new environment. Preparations began for its replacement by an agreement between the Gloucester Harbour Trustees and the Bristol Port Company to ensure the continuity of the pilot boat service, the level of charges and the continued participation by GHT in the conduct of the service supplied by the Bristol Port Company. The writing was, therefore, on the wall for the joint arrangement to come to an end after only five years.

January 1995 saw the formal demise of the Pilot Boat Company when an agreement was signed, selling the Gloucester Harbour Shares to The Bristol Port Company for £1, with the latter committing itself to "*use its reasonable endeavours...to make available a pilot boat...to and from...Barry (or other place..)*". GHT would pay for those services on a per Act of Pilotage basis.

Thus, after just over 20 years, the Bristol "parent" body once more assumed responsibility for providing pilot boat services in the Estuary with, this time, improved assurances for the Gloucester Harbour Trustees.

PILOTAGE DIRECTIONS

It is not until 1991 that evidence can be found clarifying the Harbour Authority's rules relating to compulsory pilotage and exemptions. The Pilotage Directions issued in January 1991, made under Section 7 of the Pilotage Act 1987, contained directions dealing with, inter alia, the area for compulsory pilotage; exempt vessels and the issue of pilotage exemption certificates; procedures for ordering pilotage and areas for boarding and landing; and the obligations of masters of vessels. Later Directions,

in December 1996, May 1997 and November 1999, dealt with the licensing of Second Class Pilots and their promotion to First Class Pilots.

The area to which compulsory pilotage applied, and continues to apply is namely:-

The seaward limit

a line from the Welsh shore at Redwick in the County of Gwent due south to the limits of the Port of Bristol, thence northward to the beacon on Denny Island and thence to the English shore south of Severn Beach in the County of Avon (now South Gloucestershire District Council)

The inward limits

on the River Severn, the foot of the weir at Maisemore on the western parting of the river, and to the foot of the weir at Llanthony on the eastern parting of the river, both near Gloucester

on the River Wye, Bigsweir Bridge .

Pilotage is compulsory for all vessels except for those whose dead-weight tonnage is less than 100 tonnes and not carrying dangerous goods as specified by the appropriate legislation.

In 1999 the Trustees revised the Pilotage Directions to incorporate matters arising from legislation and the new Byelaws.

The Pilotage Directions can be seen on the Trustees' web site.

PILOTS

Stone's History of the Gloucester Harbour Trustees did not deal with the role of the pilots and the Pilotage Authority, as it was primarily concerned with the Harbour Authority and its responsibilities. The main requirement of the 1890 Order was "*to ensure that the Trustees as Harbour Authority disposed of their income, in a manner which was calculated to benefit the navigation of the Severn Estuary*". Thus the emphasis was on the installation and upkeep of the navigational aids.

Although at all times self-employed, the Pilots were represented on the Trustees during a period of considerable change, including the increase in the size of ships; the added problems posed by the Severn River Bridges; the vagaries of trade into Sharpness; and the considerable improvements in navigational aids (see Chapter 4). Pilot Spiers was the representative until 1975, followed by Ron Morgan, Brian Richards and George Woollard. In December 1998 Keith Hadley became the Pilots' representative.

Like the Trustees' Chairmen, the pilots have given long and first class professional service to shipping in the Estuary. Ron Morgan, the longest serving pilot, retired in 1983 after 45 years; Peter Tippet retired in April 1996 after 30 years on the river; Brian Richards in 1995 after 26 years; George Woollard after 27 years in November 1998. The full list is given in Appendix B.

Although the pilots were self-employed, it was constantly necessary to monitor their level of earnings. In 1957 official recognition was given to the fragmented nature of pilotage around the coast of the UK, and the consequential anomalies in the level of earnings enjoyed by pilots in different districts. A committee was set up under Sir Robert Letch to examine the situation and its findings and recommendations were finally agreed on behalf of thirty-two ports and districts throughout Great Britain.

In the 1970s and 1980s trade fluctuated, the size of ships increased and competition from Bristol, South Wales and other UK ports all served to constrain the number of pilots deemed necessary. At the time of the Coopers & Lybrand report in 1983 there were 13 pilots.

The pilots formed a co-operative in 1988 as Amalgamated Gloucester Pilots (AGP) Ltd. By this time there was only sufficient work for eight pilots. Fortunately, three were able to retire early and a fourth agreed to transfer to another port. AGP's relationship to the Trustees was bound up in an agreement, which respected the pilots' wish to be self-employed and prescribed the method of payment for their services based on a standard retainer and a further sum based on the volume of trade through the Harbour, calculated on a rate per DWT

The succeeding years involved annual negotiations to determine the sum to be paid to AGP Ltd for the pilots' services. Vagaries in trade were such that, for several years, it was agreed to remove the retainer and pay to the pilots the sum remaining in the Pilotage Account after direct costs had been paid.

In 1996 a Working Party was set up to review and report on pilots earnings, the number of pilots required and the consequential effect on charges. In 1999 a new contract was agreed, as a result of which the pilots, then three in number, formed a partnership, the Gloucester Pilots Partnership (GPP). The contract, broadly similar to the 1988 document, covers the period from January 1999 to March 2004, and provides for the payment of an annual retainer plus a rate per deadweight tonne piloted. A fourth pilot has since joined the partnership, making it easier to provide adequate cover for rest days and sickness and meet the current increase in trade.

Pilotage is yet again under review. The Department of the Environment, Transport and the Regions has issued the Port Marine Safety Code. Compliance with the code is not an option - it is a requirement. Harbour authorities must exercise control over the service, including the use of Pilotage Directions, and the recruitment, authorisation, examination, employment status and training of pilots. The keynote of the Code is to make the navigation of vessels as safe as is reasonably practicable.

CHAPTER 4

NAVIGATION AIDS

The full list of navigational aids within and adjoining the area of the Trustees' jurisdiction at December 1966 is set out on pages 49 and 50 of Stone's History.

There was a total of twenty-seven aids owned and maintained by the Trustees, with two unlit, fourteen on mains electricity, nine on dissolved acetylene gas and two on electric battery. This excluded Panhurst Light and Northwick Moorings. Others were owned and controlled by British Waterways Board, British Transport Docks and the Central Electricity Generating Board.

The Log Books kept by Mr R Brice, the Assistant Harbour Engineer, are a meticulous record of the problems encountered in attempting to maintain the lights. For instance, the year 1966 closed with his report of a meeting of the Trustees when it was agreed, "*We install mains water to the White House, Sheperdine (Mr Percy Palmer, the then lighthouse keeper) as soon as possible as at present Percy has to carry his drinking water a ¼ mile in buckets*" (and this was in 1966!). More importantly, the report continues, "*After the meeting was closed, Mr Fred Collings produced a bottle of whisky and Mr Neale, Mayor of Gloucester, produced the glasses*". It appears he then drove away in his pick-up!

However, the log books show clearly the difficulties faced with the use of basic equipment still very much reminiscent of the Victorian age. Monday 2 January 1967 details a trip to Charston Light House, when "*battery terminals needed cleaning with batteries failing after 8 months use*". The log books record virtually daily occurrences of breakdown and frustration. However, the extremely hazardous nature of this occupation was evident not only in carrying out the repair work, but also in the problems of access and the need to walk through deep mud and water with rapidly changing tides. The report on Saturday 26 February 1967 is an admirable example. It relates to replenishing the Hills Flat Buoy with acetylene gas, one of many such trips.

" 11.25 *Arr.Glos Docks - Collected six acetylene gas accumulators, tools and 4-wheeled trolley*

12.25 *Arrived Fish House*

12.30 *Men arrived, and a few minutes later Percy (Palmer). This buoy has not been supplied from here before, am doing it like this as no boats available, there has always got to be a first time.*

The accumulators with all gear were loaded on to the trolley, then with 4 men and myself ahead pulling and Percy pushing, we went up the slope on to the bund and along the top, 50 yards short of the gate.

13.00. *Stopped, unloaded, lowered trolley, bottles and tools down the embankment, loaded up again and set off as before for the buoy.*

First 25 yards through nearly waist high reeds, a few yards of mud, then the remainder over rock and shale. It was a very long pull.

- 13.30. *Stopped some 100 yards short of the buoy which had not then ebbed up. It began to rain.*
- 13.45 *for the rest of the day there was a continuous succession of fierce rain and hail squalls with strong winds, and in due time we were all completely soaked to the skin. There is no shelter on the rock ledges of the Severn. It was cold.*
- 15.00 *Alongside the buoy.*
- 15.35. *Accumulators had been changed, so leaving Messrs Camm and Darnley to finish off and secure, Messrs Carpenter, Simmonds and myself pulling and Percy pushing set off back to the wall.*
- 16.00 *Arrived back at the sea wall. Messrs Camm and Darnley left the buoy and soon joined us"*

Final Paragraph - "Weather horrible, half gale force southerly wind, heavy rain and hail squalls. Cold"

This is, if anything, an understatement of the 4½ hours in bitter conditions needed to change six accumulators. CO₂ gas accumulators weigh 68 lbs when full and 48 lbs when empty!

This is not the record of an isolated incident and it is obvious that it was a horrendous and dangerous task to maintain satisfactory navigational standards in the days of accumulators and gas bottles.

Another important character of the old ways who deserves a special mention is Percy Palmer, who has already been mentioned in Chapter 2. He was born beside Berkeley Pill and lived beside the Severn all his life. For many years he lived at the White House at Sheperdine which was overshadowed by two navigation lights and lay beyond the protection of the sea wall. Percy took care of all the lights as far down as Beachley and Aust but gradually his responsibilities were decreased. In 1971 at the age of 70 years, the Trustees recognised his "long and faithful service" by the presentation of a gold watch. Mr Palmer retired in August 1979 but continued to live at the White House until ill health forced him to move to an elderly persons home. He died in February 1992.

The problems of access to navigational aids were accentuated by dependence on the availability of river transport from British Waterways. Prior to 1963, the Trustees owned nothing more than a small inflatable dinghy. However, the Trustees then bought an ex-Admiralty 75 foot motor cutter named St Kitts, which could take 6-8 men and 1 ton of gear. It was kept at Gloucester Docks, as was all the maintenance equipment for the navigation aids. Capt. Brices' log book provides many detailed examples of the lengthy and involved task of loading, the trip via Sharpness to the relevant location, and the use of a dinghy called the "Black Pig" to take the crew the final yards.

In 1974 the St. Kitts sank in Sharpness Docks, so a replacement was needed for a vessel some 20 years old. Therefore, in 1976 the Trustees purchased a 25ft glass fibre workboat, "The Trustee", delivered in June 1977. However, this vessel could only operate from Sharpness which involved long, expensive, labour-intensive journeys to the aids. Speed and efficiency were now vital to the viability of the

Trustees' operations. In addition, the Health and Safety at Work Act had concentrated minds on the dangers of the tasks involved in the maintenance of the aids. The heavy batteries and bottles, which had to be carried across the river by men up to their knees in mud and water, were phased out in favour of solar power. Hydraulic masts which could be raised and lowered were replacing the old gantries which had to be climbed with 10 metre ladders. The replacement of overhead electricity lines feeding the various onshore lights by underground cables also safeguarded supplies during rough weather.

It was, therefore, decided that the Trustees needed a new type of vessel – the inflatable. The first to be used was a Avon SR4 Sea Rider, followed by a Blagg Bosun inflatable in 1984, and the Rib-Tec 585 rigid hull inflatable in 1992. These could all be slipped at Beachley. Time was saved by trailing them by road, enabling more flexible use at differing tides. The old Austin pick-up was superseded by a Land Rover and trailer. The Land Rover not only provided the means of pulling the trailer, but also allowed more maintenance to be carried out from land in difficult ground conditions.

The minutes and reports of the late 60's record a continuing battle to maintain the navigational aids to a satisfactory standard, whilst attempting to keep costs to shipping at a level that would have no adverse effect on trade. That the Trustees achieved this is evidenced by the various reports made following the annual inspections by the Elder Brethren of Trinity House when "*local aids to navigation (were) found to be in good and efficient order*" – a regular and continuing comment - with only minor items to be rectified from time to time.

Navigational aids did not escape vandalism. The Honorary Engineer's report for the last quarter of 1967 refers to problems at Inward Rocks: "*front light was damaged by vandals who climbed up the outside of the lattice structure and forced an entry into the cabin from the external platform. Two windows were smashed, the steel door was damaged, four spare fluorescent tubes were thrown to the ground and broken and the lights had been switched off.*" In subsequent years there were incidents at Redcliffe and Chapel Rock.

The Engineer's reports for many years from 1967 onwards contain a saga of events which illustrate the continuing difficulties of maintaining a satisfactory safe passage for vessels:

- Slime Road: "*the complaint of interference from background street lighting was again followed up*"
- Lower Shoots Beacon: "*beacon reported down - reason unknown but in the absence of any report of a collision from any vessel, it is presumed that it was brought down by debris in the river during the recent gale*"
- Charston: "*light's brightness was becoming less...the main batteries were exhausted; ..of a disposable type recommended as having a year's life. They had barely lasted four months*"

Nevertheless, the Hon Engineer was able to report September 1970 that ,despite the difficulties encountered, "*the general condition of the navigational aids...is good*". The records reveal a constant battle for maintenance and improvement. In spite of the need to keep costs within budget, this included the fitting of radar reflectors, the

conversion from gas to electricity and the introduction of a marine VHF radio telephone in 1977 for contact between maintenance men and shore.

There were special problems posed by the construction of the first Severn Crossing. As late as 1979, Pilot Morgan raised the question of the *"far from satisfactory condition of the lighting arrangements on the Severn and Wye Bridges"*.

Of particular interest when detailing later developments in the provision of aids is a minute of March 1968 concerning the Shoots Channel –

"Pilot Spiers emphasised the difficulty of navigating the Shoots Channel, particularly by night, in recent months and instanced the fact that the Lower Shoots Beacon had been off station for approximately six months and that the Charston Light had not been functioning to its full power. He stated that the pilots considered that a further navigational aid should be established in the form of a lighted buoy between Avonmouth and the Shoots Channel."

Cost prevented any action being taken, but it was early warning of the problems later posed by the Second Severn Crossing.

The most difficult length of passage for which adequate and efficient navigational aids were required was the Shoots Channel. Avonmouth leading lights were often lost amidst background lighting; the Lower and Upper and Shoots Beacons consisted of timber poles supported by eight chains and, being unlit, were of no help until fitted with radar reflectors; Charston was a red light powered by dry batteries and Redcliffe Light could not be seen in poor weather. The solution proposed before the building of the Second Severn Crossing was to install the Royal Portbury Leading Lights and the Bedwin Buoy; to increase the power of Charston and alter it to a white light; to install more tubes at Redcliffe Front Light and to install a new mast with an array of tubes at Redcliffe Back Light.

The Bedwin Buoy was placed on the boundary of the Bristol and Gloucester harbour authorities and was jointly owned by those two authorities. It was vital to navigation as it marked the entry to the Shoots Channel, the narrowest navigable point in the Estuary, but it was an extremely expensive aid. A light float was laid in 1974, swept away in 1982, replaced by a SM 2 metre buoy, and then in 1987 by a solar powered Tidland Signal SB 138 buoy. The position of the buoy was in most difficult sea conditions and unbelievable tide speeds - maintenance was always an extremely dangerous task and involved the use of divers to inspect moorings. However, the Bedwin Buoy became redundant with the construction of the Second Severn Crossing and the installation of the new Shoots Beacons.

The Northwick Buoy was originally laid in 1892 to allow large vessels too deep draughted to proceed upstream to Sharpness, to be part discharged to lighters. Cargoes were mostly grain and the Dock Company wanted a floating elevator to facilitate this operation. From 1919 onwards, the Buoy's history is one of continual problems, because of its siting in a particularly hazardous part of the river. It finally broke adrift in May 1981 and was rescued by the Severn Area Rescue Association, with the assistance of a grain barge. It was fit only for scrap and was sold for £8 in March 1982. The reintroduction of a mooring in the Northwick Roadstead came about as an emergency anchorage for vessels in difficulty north of the Second Severn Crossing. This was part of the measures provided in substitution for the ship protection islands originally proposed.

The first intimation of the introduction of a new International Association of Lighthouse Authorities (IALA) buoyage system came from Trinity House in December 1975. The combined cardinal and lateral system provides for lateral marks to indicate the port and starboard sides of the route to be followed and cardinal marks to indicate where navigable water may be found.

However, It was not until late in 1978 that Trinity House requested the necessary alterations, which were completed during April 1979. Four buoys were affected, two of which became starboard marks and two becoming north cardinal marks, all carrying the appropriate colours, lights and shapes.

In January 1979, following representations from the pilots on the condition of several lights, the Chairman of GHT, Ian Walker, reported to Trustees that he had recently accompanied the Hon. Engineer on an inspection of the lights with a representative of Trinity House. As a result, an inspection by all Trustees was initiated.

The Chairman also raised the matter of a more satisfactory maintenance service being provided to the Hon. Engineer through the Trustees employing a full-time person to maintain the navigational aids to a satisfactory standard, particularly the lighting of the aids. The Hon. Engineer was instructed to prepare a report on the general condition of the existing structures, together with recommendations for improvements, to be followed by a consideration of the maintenance requirements.

Following the report, Trinity House were invited to carry out an independent survey of the navigation aids and advise on any improvements which they considered necessary to provide an up-to-date service to meet the needs of the next 20 years. Despite this, the pilots commented at the meeting in March 1979 that "*many Masters of the ships piloted commented on the high standard of lighting within the area of the Trustees' jurisdiction*".

Following these reports, the Trustees approved the appointment of a Lights Superintendent to deal with day-to-day inspection and minor maintenance of the lights. Mr Gerald Camm was appointed with effect from 1st October 1979. He was able to carry out more frequent and regular inspections of the aids enabling preventative maintenance to be carried out, which often saved the need for more costly repairs.

The report of the survey of the navigational aids carried out by Trinity House was presented to Trustees in February 1980, with detailed recommendations relating to each site. However, the report particularly stressed the importance of improving the Charston light; amending and improving the Chapel Light; and improving the day marks on the various buoys. It also contained recommendations on ways of powering the non-mains electric lights to reduce maintenance costs. A period of three years to complete the priority works was considered reasonable. Consultants Preece, Cardew and Rider presented the results of an investigation into the provision of radar, which indicated that improvements would arise from the positioning of a base radar installation at Sharpness and that improvements in ship-to-shore communication could be made.

The Engineer's report estimated the costs of the proposed works at over £57,000. In view of the concern about the increased costs of maintenance and the possible adverse effects on the trade to Sharpness, two sub-committees were formed to consider the engineering proposals and their financial implications.

The reports of the sub-committees were received in June 1980. Both Capt Boyack and Mr Camm were of the firm view that the Trinity House recommendations must be implemented. They felt that the recent inspection of the aids had shown that the arrears of maintenance had led to serious structural problems. They had been to some of the seaward lights and considered it essential to eliminate, as far as possible, the necessity for regular servicing and fuelling of the existing lead acid and gas powered sources by the provision of either mains electricity or long life batteries. However, the financial situation of the Trustees was precarious. The Hon. Engineer, Roger House, warned of the high costs but pointed out that "*in fact wherever it had been reasonable to do so, that had been past policy*".

The priorities for actions were agreed as follows:

- 1) Charston Light
- 2) Chapel Light
- 3) Investigations into the feasibility of providing a third light (back light) behind Redcliffe.

Discussions centred on the need to achieve a reasonable balance between the ability of a ship to pay and the need to complete the essential improvements and deal with the arrears of maintenance on the lights in the maximum period of 5 years considered reasonable to meet the Trustees' statutory duties. In these circumstances, it was agreed to uplift the local light dues from 1st July 1980, noting a Finance Sub-Committee recommendation that a further increase "to finance the Navigation Aids Programme be levied from 1st January 1981". This second increase was later approved.

The proposal to install a new back light at Redcliffe was costed at nearly £6,000 with work to commence as soon as finances permitted. Orders were placed in mid-1981 for this work to be carried out and the light became operational the following year.

Trinity House wrote in February 1981 indicating its preparedness to grant its statutory sanction for the conversion of all leading lights in the River Severn to vertical strip fluorescent lights coloured blue, which had first been suggested by Gerald Camm. This was essential to counteract the increasing curtain of yellow sodium road lighting now enveloping the Estuary margins. This change to blue lights was then unique around the English coast. The change was initially implemented at Slime Road.

The early 1980's saw a sequence of improvements to navigational aids. Chapel Light and the Lyde light were converted from acetylene gas to mains electricity. An all-round red lantern flashing for 0.3. secs every 5 seconds, powered by rechargeable batteries fed by solar panels, was installed at Charston on a trial basis. Eighteen months later, the Hon Engineer reported that Charston Light had required no attention over that period.

At the same time, whenever a buoy was brought into Sharpness Repair Yard for overhaul, the opportunity was taken to convert each one to solar power. Daymarks were now being made of plastic and longer life epoxy based paint was used for the underwater areas. By using the facilities at Sharpness instead of renovating the buoys in situ, as was the practice hitherto, a better and longer lasting job was effected, which also allowed the rock landings to be repaired.

In December 1983 Hon. Engineer Roger House was congratulated by the Trustees on his achievement in bringing the standard of lights up to the now very much improved level. Fluorescent tubes were taking over from ordinary bulbs, steel hydraulically elevated steel masts were being installed and experiments were taking place with more effective colours. The long term benefits of the improvements programme were not only the continuing lower and safer maintenance costs, but also the ability to withstand the horrendous weather often experienced in the Estuary. For example, in the winter of 1990 after a particularly bad spell of high winds and storms, "no damage sustained" was reported, a situation which would not have happened if acetylene fed lights had still been in use.

The development on the Severn shores of two power stations and the construction of two Severn crossings were the catalyst for the modernisation of the navigational aids, which involved substantial investment by the Trustees. Stones's History (Chapter 5 pp 77-82) sets out in detail the agreements with the then Central Electricity Generating Board, which are still in existence. The Central Electricity Generating Board bore the cost of the conversion of Counts and Ledges Buoys from acetylene gas to solar power and half the costs of the conversion at Narlwood, together with improvements to Hills Flats Buoy.

All the Hon. Engineer's reports throughout the years to 1989 contain a record of continuing improvements: solar power, modern lanterns and experimentation with the use of wind and water generators. The advent of the Second Severn Crossing in 1989 then produced a further cycle of investment necessitated by the chosen construction site, the Shoot's Channel, which is the narrowest channel on the river. Chapter 2, "Spanning the Severn Estuary", sets out the background to the introduction of Pilot Watch Radar, the provision of the Shoots Beacons and the consequential improvements to other nav aids.

Appendix C lists all current navigational aids with a brief history of their development. The early 1980's through to the present day was a period when developments on the river led to the navigation aids being transformed to provide a safe main navigation channel, thus enabling Sharpness to retain and develop its trading potential.

CHAPTER 5

FINANCES

Stone concludes his chapter on the finances of the Trustees by emphasising their indebtedness to the Canal Company and, later, British Waterways. This arose from the necessity to keep the rate for local light dues to a minimum in order to foster trade to the port and with the other Bristol Channel Ports. That the Trustees were sympathetic to this approach, which continued for many years, was demonstrated in Stone's History, but which has had to be tempered by changing circumstances, innovations in technology, and developments in the Estuary. By 1966 development had begun to effect the Estuary; the first Severn Crossing had been built and two nuclear power stations developed at Berkeley and Oldbury.

Stone's History confined itself entirely to the Harbour Trustees, but one cannot ignore the existence of the Pilotage Authority whose charges also affected trade in the Estuary. Both bodies had the same chairman, broadly the same composition and met on the same date - a situation which was not rectified until the implementation of the Pilotage Act 1987.

The day-to-day work relating to the Pilotage Authority was carried out by a Pilotage Agent, for many years a lady by the name of Miss Hacker. She collected the pilotage charges (in 1967 amounting to some £20,000), paid the pilots (£17,600) and transferred the balance to the Pilotage Authority. This practice continued until 1988, with the pilots bearing the cost of any delayed payments.

After deducting administrative costs, the balance annually (in 1969 £1,800) was paid to the Pilotage Authority Treasurer, Mr Victor Mundy. Up to 1973 the Authority administered the Pilots' Benefit Fund which had investments approaching £40,000, and paid pensions totalling in the region of £1,000 per year.

The range of investments is interesting. They comprise a list of Narrow Range Stocks etc. a few examples of which are:-

	Cost £	Value £
3½% Conversion Stock	1849	1001
3½% War Stock	1478	742
4% British Transport Guaranteed Stock	3899	3804
5% Northern Rhodesia and Nyasaland Stock	2087	1104

Narrow Range Stocks etc. showed a loss on valuation of £1,400 but Wide Range Stocks compensated with a gain of £2,700, comprising, for example,

	Cost £	Value £
Imperial Tobacco Co. Ltd Ordinary Stock	1165	2122
Birmingham Small Arms Company Ltd 6% Preference Stock	993	963
Tyndall Exempt Fund Distribution Units	8031	10528

It is pleasing to record that, when the investments transferred to the Pilot's National Pension Fund in March 1973, they had a market value of £56,241.

To complete the broad picture, the annual accounts of the Trustees in 1967 show an excess of expenditure over income of over £5,000 and a long term liability to British Waterways of £6,700. This loan, dated 1949, was due for repayment in December 1998. In 1958 the Trustees resolved to create a Sinking Fund to repay this loan on the due date, but in subsequent years, the difficulties in keeping up repayments to the Fund were continually stressed, culminating in 1964 in a decision to set aside £100 annually to invest in suitable security for the redemption of the loan. The Trustees' balance sheet for the year ending March 1966 shows investments in British Gas and British Transport Stock totalling some £900. There appeared to be a philosophy to buy stock in order to finance the repayment of loans on the due date.

The income of the two Authorities came from local light dues and pilotage charges. The legal authority for the latter was Pilotage Acts and Pilotage Byelaws, and for the former a series of Harbour Revision Orders, until a general power was finally given in the Harbours Act 1964 re-enacting powers introduced in 1954. The last increase prior to 1966 was made under the Transport Charges etc. (Miscellaneous Provisions) Act 1954.

In 1967 the income from light dues was £3,560, but lighting expenses were £2,560 and the salary of the Clerk 125 guineas (including the use of office). Costs were kept to a minimum to aid shipping, but both the Pilotage Authority and the Trustees were heavily dependent on external support, with administrative costs being mainly borne by British Waterways, as were the labour costs of maintaining the navigational aids.

However despite all effort, trade in the port decreased, mainly due to the loss of traffic in petroleum products, resulting in a severe reduction in the income of the Trustees.

In September 1968 there was an intimation of a possible increase in light dues, the first for five years. The Treasurer was instructed to prepare an assessment of the overall financial position. Following that directive, the Treasurer subsequently stated that whilst there had been a surplus in the past, the Trustees were faced with a possible deficit on the conservancy account in the next year estimated at £1,000. The Honorary Engineer then prepared an estimate of normal maintenance and urgent arrears of maintenance. The likely income from light dues was thought to be about £4,000 in the forthcoming year, leaving a deficit for the year of about £1,300. The Trustees had no reserve funds and it was considered that an application should be made to increase the light dues by 28½%. Since the last increase in 1963, the Trustees' costs had increased by between 25% and 28%. In the application to the Ministry of Transport, the Trustees stressed their twin objectives - the clearance of arrears of maintenance work and the creation of a Reserve Fund to meet such contingencies.

The increases were duly approved, taking effect from 1st January 1970. The Chairman of the Trustees was confident that, "*Finances should now take a turn for the better*".

It was not until 1974 that it was felt necessary to increase the local light dues again. No action had been taken on the question of a Reserve Fund which had again been considered in late 1972. The apparent inaction was a direct result of the taxation implications which meant the fund would incur tax, relief only being given when work was undertaken.

By 1974 the light dues had remained unchanged since the beginning of 1970, during which time there had been a rise of about 70% in the costs of maintenance. The estimated loss for the year ending March 1974 was over £1,000, rising to £2,000 in the year 1975. These forecasts were undoubtedly a result of the difficulties of estimating income due to the vagaries of trade into Sharpness. In June 1974 the Trustees were advised, "*That whilst traffic into Sharpness is 18.7 % down on the equivalent period last year and trade prospects are difficult to forecast for the immediate future, the interest shown in Sharpness by a number of commercial firms indicates that the long term future can be regarded with optimism*".

Thus began a saga of increases in light dues which related in part to inflation, in part to the fluctuations in trade and in part to the realisation that significant improvements were necessary to navigation aids as a result of the arrears of maintenance and the introduction of new regulations. The attempts to maintain dues at a low level to assist trade into Sharpness did not appear to have achieved that objective and had produced a detrimental effect on navigation aids.

In March 1976 the Trustees agreed that "*in common with the majority of ports in the UK, we should change from NRT (Net Registered Tonnage) to GRT (Gross Registered Tonnage) as the basis for charges*".

Increases in charges from the 1st August 1976 to 1985 occurred almost annually, raising dues on Foreign ships from 2.44p per G.R.T. to 9.5p per G.R.T. and that on Home ships from 1.24p to 6.5p per GRT. During this same period, lights maintenance costs rose from just over £7,000 to £29,000.

After 13 years as the Trustee's Treasurer, Mr Victor Mundy was succeeded on the 29th September 1978 by Mr Harold Brunson, the then Gloucester City Deputy Treasurer. In his first report relating to the budget for 1979/80, the Treasurer, mindful of the increase in expenditure on navigational aids, suggested that, whereas in the past the financial policy had been to work on a year to year basis (i.e. to expend the yearly income fully and avoid creating a balance which was subject to corporation tax), he considered it prudent to build up a balance for the future, notwithstanding the fact that a balance would arise out of taxed income. Various members spoke on this matter and it was clearly the view that, with the trend in high interest rates, the Trustees would be better placed if a balance to meet peaks of expenditure was built up.

The Trustees began to feel the effects of the increased expenditure on navigational aids and the decreased support from British Waterways on "subsidised" engineering and administrative services. For example, in 1979 the salaries of Trustees' officers were "uplifted" by 40% and office accommodation was provided. For the first time the officers' salaries were linked to an appropriate British Waterways Grade, rather than the ad hoc arrangements previously pertaining - 125 guineas each for the Clerk and the Treasurer in 1966.

The Trustees were now beginning to operate in a changed financial environment, where all organisations were committed to awareness of costs, the need to obtain value for money and the emergence of greater regulation on their activities.

In March 1980 two sub-committees were formed to consider:

- a) the engineering proposals and,
- b) the financial implications

Their reports inevitably recommended increases in light duties and the subsequent discussions centred on the need to achieve a reasonable balance between the ability of the ship to pay, and the need to complete the essential improvements and deal with the arrears of maintenance on the Lights in the maximum period of 5 years considered reasonable to meet the Trustees' statutory duties. This resulted in increases in July 1980 and January 1981.

In June 1981 the Treasurer was able to present a report showing an overall surplus of £4,400, but he pointed out that the Trustees needed a working balance of that magnitude for their day-to-day operations. The position was sufficiently favourable for a start to be made on the Improvement Programme.

The favourable financial position was enhanced by the settlement of charges due from the CEGB for works carried out on the navigational aids under the 1962 Agreement. A series of meetings had discussed the works made necessary by the erection of the two nuclear power stations, showing the weakness inherent in that Agreement, which made it difficult to implement. However, successful negotiations resulted in many improvements being carried out adjacent to the power stations - another step in the upgrading of the navigational aids.

In 1982/83 the Trustees committed themselves to a total improvement programme costing £33,500, and the continuation of the policy " *of seeking to make the channel lights more maintenance free*".

Unfortunately, the Treasurer Mr Harold Brunson died in 1983 which was a great loss to the Trustees. Mr Geoffrey Chambers, the Treasurer of the City of Gloucester, stepped in to fill the breach for the next twelve months, after which Mr Howard Baker, the then Deputy City Treasurer, was appointed.

In January 1985 the Green Paper on Marine Pilotage was issued by the Department of Transport. It envisaged a significantly changed role for the Trustees in which they would also become responsible for organising pilotage; in effect, a merger of the roles of the Gloucester Pilotage Authority and the Gloucester Harbour Trustees.

Although the Trustees' finances were in good shape, they could not withstand some of the problems they would face in taking on Pilotage. In particular, they did not have the capital assets required for boarding and landing or to cover the employment of pilots. In their submission to the Department of Transport the Trustees, whilst being prepared to accept the responsibility for the pilotage service, indicated that the responsibility could only be assumed, if the function came to them unencumbered by any financial responsibilities not of their making e.g. redundancy payments.

The Trustees foresaw a difficult time as a consequence of this considerable change in their responsibilities. There was an operating deficit of £3,283 in the year ending March 1985 and concern was expressed over the trade forecasts which would lead to a reduction in income. This mainly arose from the closure of the Quedgeley petrol depot and, subsequently, the loss of animal food supplies and grain exports. The bonus was that the continuing investment in improvements to navigation aids was resulting in lower maintenance costs.

In mid-1986 deep concern was expressed at the current level of traffic into Sharpness Docks. The reduction in income received would affect the level of repairs and maintenance work which could be carried out by the Trustees in the future.

However, a further ingredient was added in 1986 by the proposal for the English Stones Bridge (the Second Severn Crossing). The Department of Transport had their attention drawn, inter alia, to the need to cover the Trustees' relevant expenses.

In 1987 the Pilotage Act was on the Statute Book and in September 1987 the Treasurer reported on the financial effects. The range of responsibilities of the Trustees would alter. The pilots would need to be paid monthly even though trade terms delayed payments to the Trustees for pilotage by at least 28 days. Therefore, there was a need for working capital, then estimated at £25,000, together with appropriate guarantees against failure of traffic. Redundancy payments could not be met from Trustee's income and proposals were made to relevant Gloucestershire Local Authorities and British Waterways suggesting ways in which they could help. BW provided an interest free loan of £58,000 for 10 years to deal with redundancy and traffic loss, whilst Gloucester City, Stroud and Gloucestershire County Councils likewise provided loans totalling £25,000.

The Act required the "*competent harbour authority*", in this case the Gloucester Harbour Trustees, to "*offer to employ under a contract of employment any person it authorises (as a pilot)*" unless "*a majority of the relevant license holders have agreed...that it need not do so*". A subsequent ballot of the pilots resulted in an offer to relieve the Trustees of the liability to employ them. Discussions and correspondence between the Pilots, their representatives and the Trustees resulted in agreement on the draft heads of a Service Contract in August 1988.

The Pilots were formed into a co-operative, "Amalgamated Gloucester Pilots Ltd". The main heads of the Contract were that the Company should provide persons who the Trustees could authorise as Pilots, Duty Pilots and Assistant Pilots, and be responsible for their efficiency, together with equipment and training. The Trustees would in turn pay the Pilots a retainer to cover certain standing charges, plus a rate per DWT to be paid monthly in arrear. Prior to the amalgamation of pilotage and harbour authorities under the 1987 Act, the pilots "paid themselves" with the balance being paid to the Pilotage Authority. Under the new arrangement the emphasis was changed to payment by the new Authority, with a degree of risk falling on them, if trade to the port was significantly reduced. The Agreement, although dated July 1991, was effective from October 1988.

Three of the pilots, Messrs Spiers, Griffey and Tytherleigh, took advantage of the change in legislation and decided to retire early, reducing the pilot numbers to nine. APG Ltd was prepared to work with eight pilots and one, Mr Fryer, agreed to be transferred to Portsmouth. The payment of compensation and disturbance payments of £61,000 was met by the Trustees.

The Pilotage Act authorised "*a competent harbour authority... to make reasonable charges in respect of the pilotage services provided by it*" and reiterated the provisions of the Harbours Act 1964 relating to the Accounts of the Authority.

The Gloucester Harbour Revision Order 1988 was concurrent with and necessitated by the Pilotage Act. Apart from revising the constitution of the Trustees, dealt with in an earlier chapter of this history, it made further provision concerning the Trustees' powers with respect to a reserve fund, the acceptance of gifts, borrowing powers and byelaws.

It was necessary to make changes in the financial arrangements as a result of the merger of the Pilotage Authority and the Harbour Trustees for the payments to

Amalgamated Gloucester Pilots and the collection of charges from shipping agents and ship owners. These were outlined in a report of the Treasurer in September 1988. Bank accounts were reorganised and billing arrangements set up under the Receiver and Collector.

During 1988 there were continuing discussions with the Department of Transport seeking full recovery of all costs associated with the provision of navigational aids made necessary for safe navigation by the construction of the Second Severn Crossing. The costs were to include: the capital costs of any additional navigational aids, including harbour radar; the maintenance and operation of those navigational aids, including harbour radar; and the Trustees' costs in investigating any matters relevant to navigational safety through the tendering and construction periods. Dyson Bell Martin were appointed as Parliamentary Agents to act on behalf of the Trustees and also as solicitors in respect of the Agreement with the Department.

During this period of upheaval the state of the Trustees' finances continued to be somewhat fragile. A £10,000 deficit was forecast for 1987/88, despite an increase of 10p per DWT in pilotage charges in January 1988. Inevitably, administrative costs were rising and a revision of staffing was necessary. In June 1989 the Chairman of the Trustees reiterated the view of the British Waterway's Board that the Trustees must eventually stand on their own feet financially. However, the Agreement with the Department of Transport would enable the Trustees to recover all their costs relevant to the project, including overheads, and ensure they were responsible for the administrative and operational costs of most of the navigational aids in the lower harbour. Meanwhile, the CEGB would continue to be responsible for the costs of many aids in the middle harbour. Taking all these factors into account, the Chairman felt that, with the related spread of administrative costs, the net effect upon shipping charges and dues should be relatively small.

Over succeeding months, discussions with the Department achieved the objective of reimbursement of costs, including "absolute recovery" of all administrative costs and back-dating the effect of the Agreement. In November 1989 the Chairman, together with the Vice Chairman and the Chairman of the Finance Sub-Committee, were given authority to conclude the negotiation of the Agreement. The following month the Executive Officer and Clerk, Richard Claybourne, reported that the Department of Transport had accepted all the financial clauses which would be treated as in force from 1st January 1989 and that the Department were proposing an advance payment into an imprest account against which consultants' and specialists' fees could be paid. The Agreement was eventually signed on the 12th July 1991. The significance of the various financial clauses on the future ability of the Trustees to safeguard shipping in the Estuary properly can only be portrayed adequately by setting out an extract from the agreement.

"The Secretary shall finance fully the Trustees

- a) in the improvement of existing navigation aids: and*
- b) in the provision, maintenance operation repair and renewal of such further navigational aids, in addition to those extant on the 1st January 1989;*

as the Trustees may in each case reasonably require from time to time...so as to provide safe navigation through the main span of the bridge and its approaches"

"The Secretary of State shall meet all the Trustee's costs in connection with any surveillance or regulation of traffic....and that the Trustees shall be entitled

additionally to any bank interest and charges incurred and to any appropriate contribution to any overheads or administrative costs incidental thereto...."

There were caveats to ensure that expenditure was properly relevant, but the detail of the Agreement enabled the Trustees to move ahead with some confidence.

Thus began a new phase in the life of the Trustees - a move from being an adjunct to the British Waterways Board and heavily dependent on their support, to becoming an independent body with widening powers in the Estuary, with the inherent effects on staffing such as the appointment of an Executive Officer and secretarial assistance.

Income continued to be variable. In December 1989 it was reported that tonnage had fallen away faster than could have been anticipated, mainly due to high interest rates and the downturn in the building industry. Concern for the future of Sharpness as a viable port was expressed at a special meeting of the Trustees held in March 1990 but assurances from British Waterways were forthcoming that *"the future of Sharpness was secure"*.

However, problems continued. The Receiver and Collector reported that, up to April 1991, there were likely to be some 200 ships fewer than expected. Only a general upturn in the economy, particularly in the construction industry, would produce an improvement in the situation. It was emphasised that Sharpness gave good service with competitive rates.

Nevertheless, the difficulties in forecasting trade inhibited the ability of the Trustees to improve their services whilst maintaining low charges and an effective pilotage service. In his report on the accounts for the year ending March 1991 the Treasurer expressed considerable concern at the state of the Pilotage Account which was attributable to the low level of trading. The Conservancy Account indicated a reasonable position only because of the inherent recovery of overheads relating to the Second Severn Crossing and a grant of £4,000 from the BWB towards administrative costs.

The Trustees had previously agreed the principle of the introduction of the DWT (Dead weight Tonnage) as the basis for the level of charges to replace GRT (Gross Registered Tonnage) because DWT was more representative of the capacity of the class of ships entering Sharpness.

During the middle of 1991, the discussions on light dues related particularly to the additional traffic arising from the construction of the Second Severn Crossing. It was felt that such traffic should bear a higher cost because of *"the additional irritation to the working of the Trustees"*. The Trustees agreed to a consolidated charge "up front" by direct debit every three months. The final agreement resulted in *"variable charges commencing at £14,000 per quarter payable in arrears throughout the actual period of construction of the piers and main cable stay spans, such charges to be adjusted to reflect any change in the light dues during each quarter"*. Pilotage charges were the subject of a separate arrangement incorporated within a contract between Amalgamated Gloucester Pilots Ltd and Laing-GTM relating to the provision of professional advice, training and pilotage for vessel movements within the harbour area.

During the period of the early 1990s the records of the Trustees constantly reiterated the financial problems of the Harbour Authority. In September 1991 the

Treasurer " *could not emphasise too strongly the adverse position*". The Chairman of the Finance Committee pointed out, however, that "*any increase in pilotage charges could be counter productive and that the remedy lay in reductions in expenditure to meet the current trading position*".

The Trustees' greatest concern was in the area of Pilotage. The low level of trade inhibited the provision of a guaranteed full-time pilotage service, yet it was vital to maintain the latter at a level to meet future trade requirements and provide adequate remuneration to the pilots to maintain that service.

The continuing problems were made clear by the Treasurer during his presentation of the 1991/92 and 1992/93 budgets. His 1991/92 budget was based on the current flow of trade being 750,000 DWT and on the existing contract with the Pilots. He emphasised that trade was not currently covering the expenditure relating to the Pilotage Contract and to the Boarding and Landing services. This would produce a deficit of over £19,500 in 1991/92 and he had made no provision in 1992/93 for its recovery. On the Conservancy Account light dues income was similarly down, but contributions relating to the Second Severn Crossing had temporarily alleviated the position. However, that income was of a temporary nature.

The Chairman agreed with the need to keep the Trustees' minds firmly on the long term financial picture, but felt that, in the short term, the significant maritime presence of the contractors for the Second Severn Crossing would be financially beneficial. The problem area continued to be the Pilotage Account and the necessity for continuing payments under the Pilotage Contract to be based on a break-even situation was emphasised, thus avoiding deficits and the termination of the Pilotage Service.

The tenuous nature of the Pilotage Account prompted continuing variations in the basis of payment to AGP. In 1995, it eventually reached a situation where AGP were paid the sum remaining monthly in the Pilotage Account after direct costs had been paid.

In 1991/92 the Trustees' Accounts indicated an overall loss of approximately £20,000, but a surplus of £3,300 on the Conservancy Account. However, the finances were beginning to show an improvement, so that the Chairman of the Trustees was able to comment, in December 1992, on the "*relaxed situation with regard to finances believing that the Trustees would be comfortable for about up to three years and that trade was showing a modest but noticeable increase*"

Indeed, the increased traffic from the Second Severn Crossing showed increases in income of £25,000 in 1993, £70,000 in 1994, £58,000 in 1995, but dropping to £14,000 in 1996.

In December 1993 arrangements were made to commence annual repayments of the BWB loan, and in 1997 the Treasurer was able to report that all loans taken out in 1987 to deal with pilot redundancies had been repaid in full enabling the Trustees to reduce pilotage charges.

During the intervening years of 1992 to 1997, the foundations of a secure financial base were being laid. In December 1994 the Treasurer commented on the "*current satisfactory state*" of the finances "*but cautioned that the loss of income from SSC operations would have a serious effect on the future finances available to the*

Trustees". The then improved position was illustrated by the "excellent bank balance" and the "figure of £150,000.. invested at an advantageous rate".

In November 1994 Laing/GTM sought a review of navigation dues charged under the Agreement made early in 1992.

The reduction in construction traffic had reduced conservancy income and the 1996/97 budget reflected this by a decrease of £25,000. Words of caution began to be expressed as the Trustees were now relying on bank interest to balance the books.

Pilotage charges, having been frozen for the three years to 1996, were increased by 1.0p with effect from the 1st October of that year. Despite this increase, income fell by £8,000 during 1996/7. However, the repayment of all loans enabled the Trustees to review that position two years later and reduce pilotage charges.

The Account relating to the Second Severn Crossing was self-financing with payments being made by the DOT quarterly. The construction period over, negotiations now moved to the maintenance period. In September and October 1996 meetings were held with the Highways Agency and Severn River Crossing plc (the bridge operators). Between them they agreed to meet all the future costs of maintaining the Northwick Buoy and Anchorage and the PWR system.

From a position in the 1960's, when the financial situation was very much a "hand to mouth" existence, the construction of two generating stations and two crossings of the Estuary, with their inherent investment to maintain commercial river traffic, had improved the finances to a position where, in 1999, the Treasurer, after five months in the year, could report a surplus of approximately 16%, and a sum of £250,000 in balances. This illustrates the remarkable growth and influence of a competent harbour authority, soon to be the subject of further legislation .

CHAPTER 6

THE WIDER ROLE

Since their formation in the late 19th century the primary concern of both the Pilotage Authority and the Harbour Trustees has been the safety of navigation through the provision of navigation aids and a pilotage service. Developments in the Estuary, such as the erection of two nuclear generating stations and the first Severn Crossing prior to 1966 and the construction of a Second Severn Crossing since 1966, have necessitated significant resources being spent on discussions aimed at ensuring that this objective continues to be achieved. The role of the Authority and the Trustees in these developments has been detailed in Stone's History and in preceding chapters of this history.

These, however, are developments that have been completed. The consideration of other issues and their effect on shipping illustrate the widening role of the Trustees as a "guardian" of the Estuary.

Environmental Issues

Part 6 of the Gloucester Harbour Management Plan (see GHT web site) highlights the general duty of the Trustees under the Harbours Act 1964, as amended by the Transport and Works Act 1992, to exercise their functions with regard to nature conservation and other related environmental considerations. Appendices 1 and 2 of that document indicate the nature conservation designations within the Gloucester Harbour area.

SSSIs are established within local authority boundaries and GHT has had to negotiate an agreement with the Nature Conservancy Council covering access for the maintenance of navigational aids. The Severn pSAC has given the Trustees most cause for concern - Bristol Port Company objected to, but later resolved, the scientific content of the proposed designation, but have maintained objection to the form and extent of management proposed. It is the inclusion of the shipping channels that has caused concern and, as was noted earlier, GHT are seeking a presumption in favour of shipping within the scheme of management.

Legislation has placed a significant additional responsibility on the Competent Harbour Authority, but with no parallel authority to recover the costs arising from this, as did the Conservation (Natural Habitats &c) Regulations 1994. Activity began quickly. In June 1994 the Chairman and Executive Officer attended a meeting at the offices of Avon County Council in Bristol where a submission to the European Union was outlined. It comprised a "Series of Linked Models to Promote Sustainable Development on Five Major European Estuaries". It aimed to provide a "*strategic framework for the integrated management of the estuary to enable decisions on development to be corporately made*". The prime movers were Avon and Glamorgan County Councils. However, it became clear that EU funds would not be forthcoming and the authors of the plan then attempted to produce a revised scheme.

There was a proliferation of organisations formed at this time relating to the Estuary e.g. the Coastal Estuary Cell, Standing Conference of Severnside Local Authorities (SCOSLA), English Nature Group, and the Severn Estuary Strategy Group (SES) all of which demanded at least a watching brief from the Trustees.

Severn Estuary Coastal Cell

This body was formed by Welsh local authorities adjacent to the Estuary with the object of producing a Strategic Management Plan for the Estuary. Its major feature was control of the development of land above high water mark which later became known as the Shoreline Management Plan. The Trustees did not make any financial contribution and had little involvement, but the emergence of this and other bodies highlighted the need for proper estuarial management, which was the subject of discussion and correspondence between the Chairman and the Minister.

In March 1995 the Chairman reported on a recent meeting of the Ports Technical Panel which had resulted from concern that a variety of initiatives were being taken by local authorities and other bodies to set up partnerships which could produce recommendations detrimental to the work of Port Authorities at national level. The Government had set up a coastal forum to discuss points of general and mutual interest in the national context. Bristol Port Authority were represented by Cdr. Bradley. The government view at that time appeared to be that local estuarial management was best left to local interests.

The Ports Technical Panel advised that the ports needed to protect their future and this could best be done if they took a closer interest in estuarial management and were, therefore, currently maintaining contact with the NRA Strategy Project Team through Capt. Neils Westberg, Havenmaster of the Bristol Port Company. The Trustees backed this approach and empowered the Panel to act with one voice in relation to estuarial management.

Severn Estuary Strategy

In 1995 another body appeared on the scene, the Severn Estuary Strategy. This partnership of local authorities and government organisations was set up to achieve a co-ordinated approach to "the wise use and management of the Estuary" and to work towards the development of the Severn Estuary Management Plan. The Trustees were not invited to participate initially. Therefore, in September 1995 Mrs Susannah Bleakley, Project Manager of the Strategy, attended a meeting of the Trustees to explain the background and draft programme for the project. The SES was derived from the failed bid, referred to earlier in this chapter, by Avon and West Glamorgan County Councils. The Trustees expressed concern that conflict could arise between the "raison d'être" for operating a port and the demands of a Special Area of Conservation. They saw the forum envisaged by the Strategy as primarily a means for users to facilitate management. GHT needed to take a pro-active role over and above the action of other ports. It needed to co-operate, but also have an independent view because of the large size of the Estuary and its three distinct parts: the sea, the marine estuary and the drying estuary.

However, despite the view that the Trustees should have an independent role, the Trustees' representative on the SES Steering Group was, via the Ports Technical Panel, Cdr. Joe Bradley of the Bristol Port Company.

In May 1996 Cdr. Bradley produced a paper, "Towards a Management Scheme for the Severn Estuary". It was primarily directed at the effects of the Habitat Regulations but highlighted other estuarial initiatives, including the SES, the Coastal Cell Group and the Catchment Management Plan of the Environment Agency.

In May 1997, SES launched its Joint Estuary Issues Report, to which GHT had been a significant contributor. Subsequent to this report GHT's involvement became more direct in that meetings of the Steering Group were attended by Mike Johnson, GHT's Marine Officer. Such meetings continue to be held with a watching brief being maintained by the Trustees.

Following Cdr. Bradley's report, the Chairman and the Clerk attended a meeting of "relevant authorities" concerned with the proposed Special Area of Conservation. (GHT is a "relevant authority" under Regulation 5 of the Conservation (Natural Habitats) Regulations 1994.) Further meetings took place, from which it became evident that the Trustees should play a leading role in the formation of the statutory management structure. GHT preferred the management structure suggested by the Ports Technical Group which provides a separate management group for the Gloucester Harbour area under a main SAC management group

February 1997 saw a meeting of relevant authorities which agreed to set up a Steering Committee to report on the way forward and the financing of the work. It was anticipated that the initial contribution by the Trustees would be £200 rising to upwards of £700 in subsequent years. A Management Group was subsequently formed and held its first meeting on 10th December 1997.

Yet again, the proliferation of bodies was causing concern. In March 1998 the Trustees noted brief reports on recent meetings of the Severn Estuary Strategy and Shoreline Management Group. It was again felt that there were too many groups working in isolation and duplicating effort. The Chairman pointed out to a meeting of the Trustees that the Shoreline Management Plan had statutory backing, the proposed Marine Special Area of Conservation may get statutory backing, but the SES was non-statutory. The Trustees were of the view that there needed to be a zoned approach to the Estuary, with GHT taking the lead in the Upper Severn Estuary.

Correspondence between English Nature, the Countryside Council for Wales (CCW) and the Trustees highlighted the concern felt about the constraints included in the pSAC with the Trustees pressing for an assurance that there should be a presumption in favour of shipping in navigation channels.

In April 1999 it was reported that, following a meeting with English Nature and the Countryside Council for Wales to discuss management arrangements for the Severn pSAC and Wye cSAC, GHT had been invited to join Wyemag (River Wye Management Advisory Group). The aim in all discussions was to develop a shared view of the navigation and dredging activities undertaken in the Gloucester Harbour and to explore their relevance to the conservation interest of the site as defined by the pSAC and SPA designations.

The previous paragraphs are intended to emphasise the continuing complexity of environmental conservation which seems to produce an unending stream of associated paperwork.

ASERA

The formation of ASERA, of which GHT is a founder member, has been mentioned previously. This is an initiative set up by the Ports Group but, if zoning is adopted as the way forward, GHT is likely to be the principal vehicle for any direct conservancy management of the Upper Severn Zone. At the time of writing this history, the management issues have yet to be resolved, but whatever the outcome this can only add to the wider role of the Gloucester Harbour Trustees.

A Severn Barrage

Since the early 1920's onwards, the provision of a barrage across the River Severn has been the subject of much discussion and speculation. In 1976 the Energy Resources Sub-Committee of the Select Committee of Science and Technology set out to investigate Tidal Power with particular reference to the Severn Estuary. The British Waterways Board were involved primarily on a technical panel through their Principal Engineer, Ian Walker, who in his role as their Chairman, also represented the Gloucester Harbour Trustees and the Gloucester Pilotage Authority. A report by Mr Walker in December 1983 set out brief details of two proposed schemes - the Bondi Scheme and the English Stones Barrage. The Bondi scheme, Cardiff to Weston, which fell outside the Trustees' area of jurisdiction, was not considered at any length by the Trustees, who merely maintained a watching brief.

However, GHT had a significant interest in protecting the total navigational interest in the upper Estuary, as Sharpness had to continue to be able to receive the maximum size of ships for which its infrastructure has been designed. As far as the Trustees were concerned, the post barrage scenario would impose extra costs in temporary works, permanent capital works, increased on-going maintenance costs and the increased liability to overlap shipping movements. This was particularly important in the English Stones Scheme, as its line was within the Trustees' area of jurisdiction. The Trustees became increasingly concerned at the lack of means to represent their interests adequately.

The original Bondi Committee was much criticised because it did not enter into dialogue with local authorities bordering the Estuary – a fault which they recognised by establishing the Standing Conference of Severnside Local Authorities (SCOSLA) as a means of producing a unified approach to post Bondi proposals. SCOSLA set up various working parties and the Trustees were represented on the Ports Committee by Ian Walker and BWB, by the Harbourmaster, Capt. Allan Boyack. This provided a link to the Severn Tidal Power Group (STPG), a consortium headed by McAlpines, who were backed by the Department of Energy, which provided 50% of the costs.

However, throughout this period from 1982 to 1986 BWB began to distance themselves from direct involvement, leaving the Trustees to assume the lead role – a pattern which is apparent in all activities of the Trustees.

The final report of the STPG was received by Government in mid-1989 and it went on the "back burner" as the *"government did not see this as a viable proposition within the foreseeable future"* unlike the tidal barrage on the Mersey which was to proceed.

In 1985 the Minister for Transport had said that, if a viable proposition could be put forward for power generation, the Barrage could be considered as a basis for a second crossing of the Severn. In September 1989 a firm of consultants, MRM Partnership, in association with Arthur Hooker C Eng FICE, produced a further proposal on the English Stones line for a barrage which could be operated in conjunction with the proposed Mersey Barrage. The two schemes would generate electricity at different times of the day, thereby improving the flow of power from the combined schemes.

The Trustees set up a Severn Barrage Sub-Committee in 1985 and meetings continued throughout subsequent years, with the Trustees acting in an advisory role. The English Stones (Hooker reworked) was considered a more practical alternative to the Cardiff/Weston proposal. However, tidal power went out of fashion. The Mersey scheme was abandoned, resulting in the English Stones scheme becoming less viable. However, the Trustees' involvement had been vital, thus ensuring their future involvement in any subsequent barrage schemes.

In 1999 the Government produced a Green Paper on New and Renewable Energy which did not even mention the Severn Barrage. The Chairman of the Trustees reminded its author of the three tidal energy schemes investigated in the 1980's and stressed the need to look again at the issue of tidal power, particularly in relation to the Hooker Barrage proposals at English Stones. Such a proposal would have the benefits of limited environmental impact, low construction costs, and low operating costs.

There is an interesting spin-off to the barrage investigations. Early proposals in 1926/27 produced the last hydrographic survey of the whole harbour at the Government's expense. In 1962 the bulk of the harbour upstream of the Severn bridge was surveyed, but the results of Second Severn crossing sedimentation surveys cast doubt on the validity of the 1962 results. The Port Marine Safety Code issued by the DETR in March 2000 restates that the "*harbour authority has a duty to conserve the harbour so that it is reasonably fit for use as a port, and a duty of reasonable care to see that the port is in a fit condition for a vessel to resort to use it*". In particular, the conservancy duty includes a specific duty "*to survey (and regularly re-survey as necessary) and find the best navigable channel or channels*". In March 2000 the Trustees received a report from the Chairman setting out the justification for a fresh survey, the cost being in the region of £45,000. The Trustees would contribute £25,000, with the balance being financed by the Environment Agency. This survey was approved by the Trustees and carried out in the summer of 2000.

Sand Dredging

Up to early 1993 dredging in the Estuary had been spasmodic. However, in March of that year there were signs that there might be a significant shift in activity on this front. Sand was needed for the approach embankments to the Second Severn Crossing, and dredging was also necessary from time to time to deal with moving

sands. Consultancy advice had indicated that accretion of sand would increase in future years. An application was received from Westminster Dredging Ltd and on 5 March 1993 the Trustees held a special meeting to assess the implications which would involve dredging activity beyond the low water mark. Planning Authorities had

been consulted and, whilst they would look to the Harbour Trustees to operate a “duty of care”, they greeted with satisfaction the obvious advantages which would accrue from river extraction as opposed to land extraction. Considerable time was spent by the Trustees on a venture which had the potential for significant income and a much needed source of funding for improvements to the navigation aids.

Unfortunately Westminster Dredging did not win the contract for the provision of sand for the Second Severn Crossing approaches, but this prompted the Trustees to consider the future of aggregate dredging. Discussions continued with Swangrove Estates on the future exploitation of Slime Roads, and investigations were being undertaken into the dredging of sand in the Dun Sands area by Severn Sands Ltd.

In March 1994 Severn Sands Ltd sought an expansion of the base of their operations, increasing extractions to 300,000 tons per year and developing trade through Sharpness. Prospecting surveys on the North Middle Grounds in March 1998 showed the existence of reserves for potential extraction.

The extraction of sand and gravel in territorial waters is currently regulated through a Government View procedure, which is due to be placed on a full statutory basis in 2001. In April 1996 the Welsh Office set up a Steering Committee - the Bristol Channel Marine Aggregates: Resources and Constraints Steering Committee - to oversee a government funded research project into the availability of sand and gravel resources in the Estuary and, inter alia, the environmental and archaeological effects and the possible parameters of dredging operations. The Welsh Office and the Department of Environment appointed Posford Duvivier and ABP Research and Consultancy to conduct the survey, with a target date for completion of October 1999. Ports Authorities were given one place on the Steering Committee and this was filled by Lt Cmdr Bradley of the Bristol Port Company. GHT are empowered through their 1994 Harbour Order to license dredging in the Harbour, a position unique in the Bristol Channel. The report was issued in November 2000 and GHT are represented by their Chairman on the Technical Advisory Group, which is currently advising the National Assembly for Wales on its future policy on marine aggregate dredging in the Bristol Channel Marine Aggregates Survey area.

GHT possessed a large amount of data on sedimentation movement in the estuary arising from their involvement in the construction of the Second Severn Crossing and its consequential effects. The Trustees considered that the Upper Estuary should be dealt with separately from the Lower Estuary, as the problems of sand erosion, which promoted the research study, occur entirely in the Lower Estuary. They expressed concern that over-dredging in the Lower Estuary could well effect the feed of sand and aggregate into the Upper Estuary, thereby affecting the commercial viability of dredging operations in the Harbour area. This prompted the Trustees to express the view that the differing effects in the two parts of the Estuary necessitated independent representation on the Steering Committee for the Upper Estuary.

In June 1999 Severn Sands submitted an application for a Government View on sand extraction from the North Middle Grounds. An environmental and biological survey is to be conducted and, at the time of writing this history, the results of all investigations are still awaited.

Gloucester Weirs Project.

In September 1995 the Trustees were invited to attend a meeting to review the state of the river and to discuss a campaign to improve navigation on the section of the River Severn between Ashleworth and Gloucester Docks and within the Docks themselves, with particular attention to the high levels of silt in both the river and the Docks. The meeting had been organised by two river users and representatives of various authorities, including BWB, the Environment Agency, local authorities, attended. All those present agreed on the promotion of an initial assessment of the requirements for, and the cost of, feasibility studies. This initial study was to be carried out by the Trustees, through their Chairman's partnership, Ian Walker and Associates, at a cost of approximately £3,000, which was to be funded by the participating authorities.

A working party was established primarily to consider proposals for new weirs at Gloucester, utilising or replacing the two existing weirs at Llanthony and Maisemore, originally built in 1870. The principal purpose of the new weirs would be to control tidal flows into Gloucester, thereby helping to prevent the silting which hinders navigation in the river, docks and canal.

The initial report was considered by the working party in September 1996. It concluded that the "*principal interests identified in this report can be technically and economically addressed collectively at Gloucester by tidal exclusion*" and recommended the setting up of a formal Steering Group Structure with a membership of three core authorities – the Environment Agency, British Waterways and Bristol Water Company Ltd.

Those associated with the work were Gloucester City and Gloucestershire County Councils, Severn Trent Water Authority and the Harbour Trustees, the latter providing the Chairmanship and the administrative back-up. In early 1997 the working party evolved into the Gloucester River Control Structure Group on the lines recommended in the report by Ian Walker and Associates.

H R Wallingford were commissioned to prepare a scoping study, the purpose of which was to determine whether or not the proposed river control structures were a viable proposition to improve the situation, particularly the quality of the water in the Gloucester/Sharpness canal. The study was presented to the three participating authorities in December 1997. The subsequent correspondence indicated some unease at the capital cost of £13 million and its division. As a result, alternatives were pursued and in February 1999 Ian Walker and Associates were commissioned to prepare a study into the feasibility and cost of installing rubber crests to the existing weirs at Llanthony and Maisemore. This was not the first time this proposal had been considered - it had arisen during a period of extreme drought in 1976. However, a subsequent period of prolonged wet weather resulted in the works provided at that time falling into disuse.

At the time of writing this history it appears that, although considerable discussion and research has been undertaken, the project is in limbo until the participating authorities can provide the necessary finance.

Sharpness/Lydney Crossing.

In June 1995 an interesting item appeared in the Dursley Gazette outlining a proposal for a *“roll-on, roll-off ferry across the river from Sharpness to Lydney in order to undercut the tolls on the Severn Bridges”*. This was an individual enterprise, but at the same time the Forest Regeneration Partnership, an initiative by the Forest of Dean District Council, produced a review document which, inter alia, contained a number of proposals affecting the river and its environs. Its objectives included the achievement of a new Severn road and rail crossing between Lydney and Sharpness and the development of a new rail facility at Lydney aligned to the re-building of the old railway link to Sharpness and Berkeley. All these matters were within the area of the Trustees' jurisdiction. The Trustees' interests were expressed in August 1996 to the participating bodies, which were mainly concerned with the proposal to erect a multi-span bridge at the location of the former Severn Railway Bridge.

The Trustees were totally opposed to the method of construction proposed. The bathymetric and sampling studies, which had been carried out in connection with the Second Severn Crossing over the previous three years and which were to continue, had indicated significant changes to the sediment regime both upstream and downstream of the new crossing, representing a blockage to the tidal flow in the Estuary of about 9%. In the Trustees' opinion, the proposed crossing would have a similar, or possibly an even greater, blockage factor. Under their statutory responsibilities the Trustees could not allow such a level of environmental interference. However, the Trustees indicated that an alternative route for a bridge, from a position approximately 1500 metres north of Lydney Harbour to Sharpness Point, with a maximum of one pier in the river - preferably on the Forest side - with a clearance envelope which would allow for existing and future navigation requirements, would receive their support.

In December 1996 the Chairman reported to Trustees that the application by Forest of Dean District Council for funding as a Millennium project had not been granted, though an application for other funding could be made.

Disposal of Animal Carcasses

In March 1991 the Trustee's received a proposal to incinerate animal carcasses using specialised machinery in the hold of a ship anchored at locations agreed within the Severn Estuary. Although the Chairman and Trustee's Officers explored the environmental and financial issues involved, it readily became apparent that the proposal was not a viable project. However, this episode illustrates the almost forgotten use of resources on abortive projects.

Marine Safety Committees

Following publication in 1992 of the Hayes Report on River Safety (following the Marchioness disaster on the River Thames), the Secretary of State for Transport announced the setting up of District Marine Safety Committees to review, consider and implement improved safety measures on rivers. The Trustees were initially dissatisfied with the organisation of the committee structure, which incorporated inland waterways with estuarial waters, and proposed one area of control from Liverpool down to the Southwest. Eventually, a Welsh committee incorporated the upper part of the Bristol Channel.

The Trustees, initially through their Chairman, Ian Walker, and the Harbourmaster, Capt. Boyack, and latterly through their Marine Officer, Mike Johnson, have taken an active role in the evolution of the Wales District Marine Safety Sub-Committee. The most important item arising at local level was the preparation of the Bristol Channel Emergency Plan. In February 2000 the Trustees initiated a meeting to facilitate discussion on whether the callout and liaison situation might be improved in the Severn area.

Harbour Plans

The emphasis on safety in the Harbour arising from disasters such as the "Sea Empress" and the "Marchioness" prompted, in addition to the Emergency Plan, the preparation of various plans by constituent authorities. Typical was the " Counter Pollution Strategy for the Bristol Channel ".

In May 1999 a workshop was held at Avonmouth to discuss the way forward for such a strategy. Bristol Port Company had commissioned a report and would take the lead in the formation of such a plan. The Trustees resolved to play a full and proper role in the preparation and subsequent operation of the plan. In September 1999 proposals were ready to be presented to SCOSLA (Standing Conference of Severnside Local Authorities). Progress was slow in establishing a channel-wide working group, as some authorities were reluctant to become involved. In the meantime, GHT placed a contract with Briggs Marine, an approved organisation, to meet its commitments to respond in an emergency.

CHAPTER 7

THE FUTURE

This History covers the period from where Stone's History ends in 1966 to the year 2000. Those 34 years have seen dramatic changes which have been covered in earlier chapters.

In 1966 the Trustees were a low key operation continually facing financial problems. In 2000 the Trustees are a very different organisation with a much higher profile locally and nationally.

It remains a small Authority but has now a much more streamlined organisation able to meet its statutory duties and responsibilities in an efficient and very effective manner.

The Trust Port Review requires the Authority to promote a new constitution via a Harbour Revision Order which will lead to significant changes in the membership of the Board and the appointment process for new Trustees.

Perhaps the most striking difference is found in the finances of the Trustees. They now operate with reserves to meet any contingencies and have also been able to reduce pilotage charges and maintain local light dues at the same level for ten years.

All this could not have been achieved without the dedication of the Chairman and Trustees and the able support of their small staff.

One can only hope that the Port continues to thrive and prosper thus securing the livelihood of those involved in its operation. The future of the Trustees and Sharpness cannot be divorced from the future of shipping. Without the benefit of a crystal ball one cannot foretell what that future will be.

We all wish the Trustees a successful, if challenging, future.

APPENDIX A

CHAIRMEN OF TRUSTEES

1954 – 1979 F G B Clayton .
1979 to date I M Walker

CLERKS TO THE TRUSTEES

1958 - 1968 W A Stone
1968 - 1974 W R O Hagger
1974 - 1977 J Cook
1977 - 1984 G W Lloyd
1984 - J Bowdler
- 1989 K D Biddle
1989 - 1991 G R Claybourn
1991 - 1996 D F Collins
1996 - to date H R T Shackleton

HONORARY TREASURERS

1965 - 1978 V G Munday
1978 - 1983 H S Brunnsden
1983 G Chambers
1984 - to date H Baker

HONORARY ENGINEERS

1966 - 1969 Lt Cdr R F Hatton
1969 - 1970 E M Marks
1970 - 1997 R G House
(post deleted on creation of post of Technical Officer)

ASSISTANT ENGINEER

1963 - 1973 R K H Brice
(post deleted on creation of post of lights superintendent)

LIGHTS SUPERINTENDENT

1973 - G Camm
(post deleted when lights maintained under contract by AGP).

TECHNICAL OFFICER/MARINE OFFICER

1997 - to date M Johnson

HONONARY HARBOUR MASTERS

1968 - 1980 Capt H M D Embleton
1980 - 1999 Capt A Boyack

DUTY HARBOUR MASTER

1999 - to date Capt K Badsey

APPENDIX B

PILOTS

M Griffey	- 1969
J Williams	- 1969
R Morgan	1941 - 1983
L Spiers	1958 - 1988
A Tytherleigh	1961 - 1988
D Griffey	1962 - 1988
P Tippet	1966 - 1996
J Morgan	1971
R Case	1964 - 1992
B Richards	1969 - 1995
K Hadley	1969 - to date
G Woollard	1971 - 1998
K Higgs	1972 - to date
R J Hopkin	1973 - 1985
P Fryer	1976 - 1988
C Wilton	1979 - 1991
D Bainbridge	1979 - 1991
D Moore	1999 - to date
W S Payne	1999 - to date

APPENDIX C

AIDS TO NAVIGATION OF INTEREST TO VESSELS NAVIGATING WITHIN THE GLOUCESTER HARBOUR

PANTHURST

Characteristic: F. Bu

Position: Lat: 51° 42'.56N
Long: 2° 28'.40W

OS Grid Ref: SO 667 013

Description: Single vertical blue fluorescent on yellow fibreglass mast.

History: Posts were established at Panthurst Farm in 1894. These provided guidance, when in transit, through the channel formed by blasting in 1893 over the Bull Rock. It is unlikely that these posts were lit, and there is no record of their demise. However, in 1912 a single lit beacon was established. Initially a fixed white oil lamp screened on each side, mains powered fluorescent (blue) lighting was installed in 1972 in the form of a "St Andrew's" cross. Present vertical lighting and yellow mast was installed in 1987 following improvements to the flood bank. Used as a breast light to indicate where vessels should commence swinging prior to arrival at Sharpness Dock entrance.

BERKELEY PILL LEADING LIGHTS

Characteristic: F.G

Position:	Front	Back
Lat:	51° 41'.95N	Lat: 51° 41'.70N
Long:	2° 29'.30W	Long: 2° 29'.32W

OS Grid Ref: SO 662 002 SO 662 001

Description: 8m steel lattice tower with White lantern house containing eight green fluorescents. White board daymarks.	12m steel lattice tower with white lantern house with eight green fluorescents. White daymarks.
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History: Established in 1906 to provide a leading line for the channel to Sharpness Dock entrance. Original structures were wood poles fitted with oil lights (ex Sheperdine). Gas lighting with a flashing characteristic was installed in 1926. The steel lattice towers were erected in 1937. In 1951 the gas system was replaced with a battery lighting system, with synchronisation of the flashing lights being completed in 1953. Mains power and fluorescent lighting was installed in 1964.

BULL BEACON

Characteristic: Iso 2s

Position: Lat: 51° 41'.8N
Long: 2° 29'.7W

OS Grid Ref: ST 657 998

Description: 15m steel mast, mains powered isophase light every 2 seconds. Polished steel bands are placed at 5-foot intervals around the column and indicate the depth of water over the rock. The uppermost band is at 41 feet (12.5m) above rock level.

History: Established in 1894 following the levelling of Bull Rocks to 2 feet below Sharpness cill height. To mark the starboard side of the channel cut through Bull Rock. Gas lighting was installed on the chain-stayed wooden pole beacon in 1958. The pole also carried a tide gauge. Following demolition by a vessel in 1984, the beacon was replaced by the present self-supporting 15m steel mast carrying a mains powered light.

CONIGRE LEADING LIGHTS

Characteristic: F.Bu F.Bu

Position: *Front* *Back*
Lat: 51° 41'.42N Lat: 51° 41'.48N
Long: 2° 29'.90W Long: 2° 29'.72W

OS Grid Ref: ST 655 993 ST 657 993

Description: *Front* *Back*

21m steel lattice mast carrying two vertically disposed vertically oriented blue fluorescents, with yellow cross (upper) and white board (lower) day-

29m steel lattice mast carrying two vertically disposed vertically oriented blue fluorescents, with two horizontal bar daymarks near top marks

History: Two fixed white lights were in use at Conigre in 1891. They were used to indicate the "low way" across the Lydney Sand from Guscar Rocks. A green/red sector showing over the Bull Rock was in place in 1888. It is unknown when this sector was discontinued, although references to it remain until 1956. The oil lamps were replaced in 1948 with Londex battery powered items which exhibited a flashing characteristic; these remained unsynchronised until 1953. The construction of the nuclear power station at Berkeley resulted in the erection in 1960 of two steel lattice towers fitted with mains powered fluorescent lighting.

FISHINGHOUSE LEADING LIGHTS

Characteristic: F

Position: *Back light* *Front lights*

Lat: 51° 40'.87N
Long: 2° 31'.00W

Lat: 51° 40'.95N
Long: 2° 30'.90W

OS Grid Ref: ST 643 983

Description: *Back light* *Front lights*

12m Abacus mast, 4 vertical white fluorescents, orange/white daymarks

4m white fibreglass tower, 4 vertical white fluorescents, red sector light, orange/white daymarks. Additional daymarks on seawall in front of light.

History: A single white light with red sector showing when abeam Haywards Rock was in place in 1891. Leading lights were established in 1894 to provide a line through Bull Rock channel. The earlier red sector was incorporated into the front light. Battery powered flashing lights installed in 1948. Synchronising of the flash was carried out in 1953. Mains powered fluorescent lighting installed in 1960, back light timber structure renewed and front light steel lattice tower installed. Abacus back mast and fibreglass front tower installed 1985.

HAYWARDS ROCK BEACON

Characteristic: Q

Position: Lat: 51° 41'.22N
Long: 2° 31'.11W

OS Grid Ref: ST 642 988

Description: North Cardinal beacon with quick flashing white light characteristic to mark Haywards Rock.

History: An unlit buoy was first installed in 1906. A small winker beacon was installed on the buoy in 1956. A new steel buoy with gas lighting was installed in 1958. Solar powered lighting was fitted in 1987.

A grp buoy was installed in 1991 and utilised solar panels and fittings removed from its predecessor.

The highly dynamic tidal regime and soft nature of the rock bed resulted in continual erosion of the rock and considerable wear to the mooring chains. The rock required frequent remedial work in the form of concreting to avoid loss of or damage to the buoy.

The high levels of maintenance and associated risk led, in June 1999, to the installation of a 12.5m steel beacon at Hayward Rock and the removal of the buoy.

HILLS FLATS BUOY

Characteristic: Fl.G.4s

Position: Lat: 51° 40'.7N
Long: 2° 32'.6W

OS Grid Ref: ST 624 978

Description: Starboard hand mark exhibiting one green flash every four seconds and carrying a starboard hand topmark to show position of Hills Flats Rocks.

History: Hills Flats rock was marked with an unlit buoy in 1899. The present green can buoy, manufactured by Charles Hill of Bristol and installed in 1961, was fitted with gas lighting. Conversion to solar power and battery was made in 1987.

A lantern utilising modern Light Emitting Diode (l.e.d.) technology was installed in September 2000. The reduced power consumption has enabled the number of batteries on the buoy to be reduced to one. A solid-state voltage regulator has replaced the previous electro-mechanical unit.

SHEPERDINE LEADING LIGHTS

Characteristic:	F	
Position:	<i>Sheperdine Rear</i>	<i>Sheperdine Front</i>
	Lat: 51° 40'.07N Long: 2° 33'.08W	Lat: 51° 40'.04N Long: 2° 33'.23W
OS Grid Ref:	ST 618 967	ST 616 966
Description:	<i>Sheperdine Rear</i>	<i>Sheperdine Front</i>
	12m black steel lattice mast with white lantern housing and daymark carrying eight vertical white fluorescents	8m grey enclosure carrying eight vertical white fluorescents and radar antenna

History: Leading lights for eastern end of Barnacle Channel established in 1886. Timber poles were replaced with steel lattice structures in 1906. Fixed white oil lamps until 1948 when converted to battery powered flashing white lights (unsynchronised). Lights were synchronised in 1953. Fixed fluorescent lighting installed 1961.

LEDGES BUOY

Characteristic: FI(3)G.10s

Position: Lat: 51° 39'.75N
Long: 2° 34'.05W

OS Grid Ref: ST 608 962

Description: Starboard mark flashing Green (3) every 10s to mark Narlwood Rocks and power station reservoir wall.

History: This new aid of the same specification as the Counts buoy was built by Charles Hill of Bristol and installed in 1961. Originally fitted with a gas powered light and bell, this mark was converted to battery and solar panel operation in 1986. A lantern utilising modern Light Emitting Diode (l.e.d.) technology was installed in September 2000. The reduced power consumption has enabled the number of batteries on the buoy to be reduced to one. A solid-state voltage regulator has replaced the previous electro-mechanical unit.

All costs associated with the installation, operation and maintenance of this aid are borne by Magnox-BNFL as operators of Oldbury Power Station.

NARLWOOD BEACONS

Characteristic: Fl. 2s

Position: Lat: 51° 39'.5N
Long: 2° 34'.70W

OS Grid Ref: ST 601 958

Description: Self-righting steel masts, 12m (front) and 17m (rear) synchronised solar powered white flash every 2 seconds. Provides leading line for Hills Flats channel.

History: Established in 1900. Original installation comprised fixed white lights (oil burning) on timber poles. Lighting changed in 1926 to gas-powered automatic flashing white lights. Present beacons were installed in 1964, the gas lighting being replaced by solar panels and batteries in 1987.

A single pole or perch had (*see Beechey chart of 1847 and Admiralty chart 1179 of 1906*) been erected on Winstone Rock, and it appears likely that it remained in service until the installation of the set of leading lights.

The remains of the Counts and Winstone beacons are still in existence; the Winstone beacon must have been the first aid to navigation erected in the River Severn.

COUNTS BUOY

Characteristic: Q

Position: Lat: 51° 39'.40N
Long: 2° 35'.75W

OS Grid Ref: ST 589 957

Description: North Cardinal buoy with quick flashing light characteristic to mark south side of Barnacle Channel and reservoir wall.

History: Present boat-shaped buoy installed in 1961. Originally fitted with gas powered light and bell, this mark was converted to battery and solar panel operation in 1986. The present buoy replaces an unlit pole beacon which had been in use since 1906.

A lantern utilising modern Light Emitting Diode (l.e.d.) technology was installed in September 2000. The reduced power consumption has enabled the number of batteries on the buoy to be reduced to one. A solid-state voltage regulator has replaced the previous electro-mechanical unit.

All costs associated with the installation, operation and maintenance of this aid are shared by GHT and Magnox-BNFL.

INWARD ROCKS LDG LIGHTS

Characteristic: F

Position:	<i>Back light</i>	<i>Front light</i>
	Lat: 51 ° 39'.20N	Lat: 51 ° 39'.22N
	Long: 2 ° 37'.50W	Long: 2 ° 37'.38W

OS Grid Ref: ST 567 952

ST 568 952

Description:

History: Leading lights established in 1886. Front light timber structure replaced with steel lattice tower in 1907, fibreglass lighthouse installed in 1985. Rear timber structure replaced in 1961 with a steel mast. This again replaced in 1985 with an Abacus hydraulic mast sited further from the front light. Mains electricity powered since 1962. Provides leading line of 252° 28' in western part of Barnacle Channel.

SEDBURY

Characteristic: 2 F.R(vert) 10m 3M

Position: Lat: 51° 37'.75N
Long: 2° 38'.93W

OS Grid Ref: ST 551 925

Description: Two vertically disposed fixed mains powered red lights on 10m Abacus mast

History: Established in 1962 and funded by the constructors of the Severn Road Bridge. Two vertically disposed fixed mains powered red lights on 10m Abacus mast installed 1988. Original light comprised two vertical fixed blue fluorescent tubes on wooden pole. Marks channel from Lyde to Slimeroad Bay.

SLIMEROAD LEADING LIGHTS

Characteristic: F.Bu

Position:	Front	Back
	Lat: 51° 37'.20N	Lat: 51° 37'.17N
	Long: 2° 38'.99W	Long: 2° 39'.03W

OS Grid Ref:	ST 550 915	ST 550 915
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Description:	White hut carrying 8 vertical blue fluorescent tubes above broad white stripe painted on cliff face	Black lattice steel tower with white lanternhouse carrying 8 vertical blue fluorescent tubes above white daymark
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History: Two fixed white lights on wooden structures established in 1915. The present steel lattice tower was erected in 1941. The oil-burning lights were converted to battery power, white flashing, in 1948, with flash synchronisation occurring in 1953. Conversion to mains operation was carried out in 1963 using yellow fluorescent tubes; the present blue fluorescent lighting was installed in 1981.

LYDE ROCK

Characteristic: Q.R.W. 5m 5M

Sectors: Red 057° - 328°, white 328° - 247°, red 247° - 156°

Position: Lat: 51° 36'.9N
Long: 2° 38'.6W

OS Grid Ref: ST 554 909

Description: Yellow lantern on 12m black lattice tower.

History: Established in 1896 to help vessels steer clear of Hen & Chickens Rocks. Initially lit by oil lamp installed on an iron structure. The present steel lattice tower was installed in 1941 following the destruction of the structure by a ship collision. Converted to battery power in 1947, to gas in 1951 then to mains electricity in 1983, when the old lantern house and platform were removed. Tide gauges are installed on the tower and rock below and read actual depth of water. To convert readings to height below MHWS add 20' to the reading on the upper gauge or 8' to the reading on the lower gauge. (Tide gauge on rock no longer in place [1998])

CHAPEL ROCK

Characteristic: Fl.WRG.2.6s 6m 8M

Position: Lat: 51° 36'.4N
Long: 2° 39'.1W

OS Grid Ref: ST 548 901

Description: Remains of white lantern housing on 8m black lattice tower.

History: Established in 1886. Original timber structure replaced in 1907 with the present steel lattice tower. Initially lit by oil lamp, converted to battery power in 1947, to gas in 1951 (above right) then to mains electricity in 1983.

CHARSTON ROCK

Characteristic: Fl.3s 5m 8M

Position: Lat: 51° 35'.31N
Long: 2° 41'.58W

OS Grid Ref: ST 519 881

Description: White painted 7m stone tower with vertical black line

History: Established in 1886 on an existing stone tower owned by the Great Western Railway Company, the oil burning light was used in conjunction with the simultaneously established Redcliffe light to provide a leading line through the Shoots. Conversion to acetylene gas was accomplished in 1926, followed in 1966 by conversion to battery operation using the lens from Redcliffe. The lens arrangement provided for all round visibility with reinforcement of the beam on the leading line. The lantern housing and lens were removed in 1980 and replaced with an all round light (with reinforcement on the leading line) powered by a combination of solar panels and batteries.

REDCLIFFE LIGHTS

Characteristic: F.Bu

Position: *Front* *Back*

Lat: 51° 36'.18N

Lat: 51° 36'.37N

Long: 2° 41'.28W

Long: 2° 41'.21W

OS Grid Ref: ST 523 896

ST 524 899

Description: *Front*

Back

10m steel lattice mast with white daymarks and 12 blue fluorescent tubes

30m Abacus column carrying 12 blue fluorescent tubes

History: Redcliffe front light established in 1886 – a fixed white light oil light on a wooden post which when in transit with Charston light gave a lead through the Shoots channel. Present steel lattice tower erected in 1910. Automatic gas powered white flashing light installed in 1926. Mains electricity to Redcliffe in 1965, with blue colour added in 1966. The back light was erected in 1982, and additional light units were fitted to the front light at this time.

NORTHWICK BUOY

Characteristic: Fl.Y.5s

Position: Lat: 51° 35'.92N
Long: 2° 38'.49W

OS Grid Ref: ST 556 892

Description: Yellow buoy fitted with mooring shackle and two yellow strobe lights each giving a flash every five seconds.

History: A mooring was established at Northwick Oaze in September 1892 for the purposes of lightening neaped vessels bound for Sharpness. The current buoy (installed in December 1994) is moored to a reinforced concrete sinker of 650 tonnes, the mooring designed to be safe for use of a 10,000dwt vessel.

BULWARK (discontinued)

Characteristic: n/a

Position: Lat: 51° 37'.20N
Long: 2° 39'.50W

OS Grid Ref: ST 544 914

Description: Yellow locker with 3m red 'H' section post carrying remains of gas-operated lantern and sun valve.

History: The Bulwark light was established in June 1966 and was used in association with the blue centre-span lights of the Wye Road Bridge to provide a lead into the river Wye for vessels trading to Chepstow resulting from the activities of Medport Ltd. Maintenance of this aid ceased in September 1982 when Chepstow was designated a "daylight port only" (Notice to Mariners 4/82).

WYE BRIDGE

The downstream face of the west pier carries a gauge board indicating height from water level to the underside of the bridge (*in feet*).

SHOOTS BEACONS

Characteristic:	Lady Bench	Q.R
	Old Man's Head	VQ(9)10s
	Mixoms	FI(3)R.10s
	Lower Shoots	Q(9)15s

Position:	Lady Bench	51° 34'.82N	2° 42'.12W
	Old Man's Head	51° 34'.72N	2° 41'.61W
	Mixoms	51° 34'.01N	2° 42'.51W
	Lower Shoots	51° 33'.82N	2° 41'.97W

Description: Each beacon is of reinforced concrete formed within precast concrete rings, and of approximate overall height 16m. Beacons carry lights and shapes appropriate to their location, and are supplied by a combination of mains, solar and wind power.

ROYAL PORTBURY LDG LIGHTS

Characteristic: Q.Bu F.Bu

Position: *Front* *Back*

Lat: 51° 30'.00N
 29'.48N Lat: 51°
 Long: 2° 43'.64W Long: 2° 43'.83W

OS Grid Ref:

Description: *Front* *Back*

A blue strobe light, screened to avoid interference to other lights, carried on lighting column on the Portbury dock north pier.

A 30m steel Abacus tower carrying 12 blue fluorescent tubes a

History: Lighting installed 1992 to provide a lead through Shoots Channel to outward bound vessels.

Lights installed & maintained by others

Location	Type	Colour / Character	Range	No. (Total)
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Second Severn Crossing:

Viaduct Piers	Pharos FA.249	Yellow Iso (4s)	3 nm	96
Main Span - centre	Seawatch 300	Racon Morse 'O'		1
Main Span - centre	Pharos FA.250	Blue Quick flashing	3nm	2
Pylon M1	Pharos FA.249	Red Fixed	4 nm	4
Pylon M1	Pharos DA.8	Fog signal (1) 30s	2 nm	1
Pylon M1	Pharos FD.310	Detector		1
Gwent viaduct	Lumen LS240/LED	Red Occ (4+1)	5 nm	1
Pylon M2	Pharos FA.249	Green Fixed	4 nm	4

Severn Road Crossing:

Beachley Pier		Quick Red		6
Beachley Pier	Fog Signal	Horn (3) 30s		1
Main Span – centre		Qk.Fl.Blue		1
Aust Pier		Quick Green		6

Wye Road Bridge:

Main Span – centre		Fixed Blue (hor.)		4
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Aust Transmission Tower:

Lower seaward corners		Qk.Fl.Green (vert.)	4
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Lydney Dock:

North Pier		2 Fixed Red (vert.)	2
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Berkeley Baffle Wall:

North, Centre & South		2 Fixed Green (vert.)	6
Centre	Fog Signal	Siren (2) 30s	1

Sharpness Dock:

South Pier		2 Fixed Green (vert.)	2
North Pier		2 Fixed Green (vert.)	2
South Pier	Fog Signal	Siren (1) 20s	1
North Pier	Fog Signal	Bell	1
Old Arm	Fog Signal	Siren (1) 5s	1

Lights no longer in existence

Sharpness Old Dock: A sectored light at the entrance to the old dock is shown on first edition OS maps and Admiralty Chart 1170 of 1906. There appears to be no record of when it was established or discontinued.

Sharpness Lighthouse: A wooden lighthouse, removed in 1905, carried a red light which when in transit with a light on the North Pier at Sharpness provided a lead to the west of Black Rock prior to the blasting of the new channel over the Bull Rock (1893). There appears to be no record of when this light/mark was established.