Establishing a Vessel Traffic Service in the Little Russel

(Technical Data Taken From IALA 1111)

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Introduction

1.Introduction

The purpose of a Vessel Traffic Service (VTS) is to improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment and/or the adjacent shore area, worksites and offshore installations from possible adverse effects of maritime traffic. Implementation of a new VTS or the re-assessment of an existing VTS should be undertaken where there is concern about the levels of safety and if, as a result of reviewing the existing safety measures, these are found to not fully meet the requirements.

In the Preliminary Assessment phase, all relevant problems in the maritime area concerned should be defined and analysed. Further, as a second step in the process, operational objectives should be established with the ultimate aim of alleviating the defined problems. The last step in this phase is to identify the most appropriate traffic management tools in terms of effectiveness and costs, and to alleviate the defined problems. Implementing a VTS may be one of these solutions.

The possible traffic problems could be related to:

- interaction of maritime traffic;
- volume and composition of traffic;
- protection of the marine environment and the surrounding area;
- the local conditions such as geography, hydrological/meteorological, and tides.

In addition, future developments in the port infrastructure and the resulting changes in traffic volumes and composition, including dangerous cargoes and any other relevant future development in the area concerned should be considered in this phase

Further developments in VTS technology and The International Convention for the Safety of Life at Sea (SOLAS) requirements for navigational and communication equipment onboard vessels should also be considered.

Furthermore in the case of a decision to establish a VTS, the following aspects need to be addressed the:

- organisational framework of Bailiwick maritime authorities; and
- present regulatory or legislative framework, including local by-laws, rules and recommendations. Special attention should be devoted to ascertain any requirement for adjusting the framework to ensure effective implementation of a VTS.

2.Overview

Vessel Traffic Services

A service implemented by a competent authority, VTS is designed to improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment.

VTS is governed by SOLAS Chapter V Regulation 12 together with the Guidelines for Vessel Traffic Services [IMO Resolution A.857(20)] adopted by the International Maritime Organization(IMO)on 27 November 1997.

The VTS traffic image is compiled and collected by means of advanced sensors such as radar, AIS, direction finding, CCTV and VHF or other co-operative systems and services.

A clear understanding of the distinction between the different categories of VTS is fundamental in the choice of service to be provided, its implementation, maintenance and periodic review. Definitions of the three categories of service are provided by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and IMO documentation however these are broad interpretations designed to provide guidance only. The purpose of this section, therefore, is to document the interpretation of the different categories of service, as adopted by the United Kingdom. Furthermore it amplifies the relationship between each category of service and explains the level of interaction, between VTS and vessel, appropriate in each case. The following is an explanation of each category of service as recognised by the UK Competent Authority for VTS.

Information Service

A Information Service is a service to ensure that essential information becomes available in time for on-board navigational decision-making.

The information service is provided by broadcasting information at fixed times and intervals or when deemed necessary by the VTS or at the request of a vessel, and may include for example reports on the position, identity and intentions of other traffic; waterway conditions; weather; hazards; or any other factors that may influence the vessel's transit.

Traffic Organisational Service

A traffic organisation service is a service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS area.

The traffic organization service concerns the operational management of traffic and the forward planning of vessel movements to prevent congestion and dangerous situations, and is particularly relevant in times of high traffic density or when the movement of special transports may affect the flow of other traffic. The service may also include establishing and operating a system of traffic clearances or VTS sailing plans or both in relation to priority of movements, allocation of space, mandatory reporting of movements in the VTS area, routes to be followed, speed limits to be observed or other appropriate measures which are considered necessary by the VTS authority.

Navigational Assistance Service

A navigational assistance service is a service to assist on-board navigational decision-making and to monitor its effects. The navigational assistance service is especially important in difficult navigational or meteorological circumstances or in case of defects or deficiencies. This service is normally rendered at the request of a vessel or by the VTS when deemed necessary.

VTS Staff

The VTS guidelines require that the VTS authority should be provided with sufficient staff, appropriately qualified, suitably trained and capable of performing the tasks required, taking into consideration the type and level of services to be provided in conformity with the current IMO guidelines on the subject.

IALA Recommendation V-103 is the Recommendation on Standards for Training and Certification of VTS Personnel. There are four associated model courses V103/1 to V-103/4 which are approved by IMO and should be used when training VTS personnel for the VTS qualification.

RADAR Services

Implementation of radar services for VTS is a complex issue and requirements of the VTS radar may have a high impact on acquisition and life-cycle costs of a VTS. The performance recommendations given by IALA V-128 are therefore divided into three different capabilities:

- **Basic** - applicable to VTS information service and, where applicable, navigational assistance service.

- **Standard** - applicable to all types of VTS as identified by IMO – information service, navigational assistance service and traffic organizational service – for areas with medium traffic density and/or without major navigational hazards.

- **Advanced** - applicable to VTS areas with high traffic density and/or specific major navigational hazards.

These capabilities may be used as applicable within a VTS, e.g. part of a VTS area may call for a Basic and another part may call for a Standard capability.

The individual VTS authority should decide on the level of specification and define requirements related to climate and topography as identified in this document. Consideration of other local conditions may dictate individual performance requirements that are independent of the level of recommendation.

Requirements to detect very small vessels for safety or security reasons may further extend requirements, beyond those identified by IALA V-128 for 'Advanced recommendations'.

Radar Parameters

Important Radar Parameters influencing radar coverage are:

- Radar frequency band
- Radar location
- Antenna height
- Local weather
- Transmitted power
- Antenna characteristics
- Receiver sensitivity
- Receiver dynamic characteristics
- Processing capabilities
- System losses

The parameters are often dependent on each other, and different vendors may choose different methods to solve the same issue. Therefore, it is recommended that overall radar performance requirements are specified, taking the local weather into consideration, rather than specifying radar parameters.

However, in order to understand how the parameters affect radar performance, the influence from some of the parameters are described as follows.

Radar Frequency

Radar frequencies selected for VTS lie typically within the S-band (10cm) and X-band (3cm) frequencies, however, higher frequencies such as Ku band may also be utilised.

The major operational effects of different frequencies are:

- For a given physical antenna size, azimuth resolution will increase with higher frequency;

- Antenna gain and, thereby, overall system sensitivity increases with higher frequency for a given physical antenna size. However, system losses also increase with frequency and may be severe at very high frequency, such as Ku band;

- Radar cross section of targets in general will increase with frequency, however, specific types of targets may give particularly strong returns in a given frequency band;

- Disturbance by precipitation increases with frequency.

The majority of VTS services use X-band radars as a best compromise, especially since technologies for rain clutter suppression have matured. Also, as a result of production volume, X-band radars are the least expensive.

The second most used frequency is S-band, due to better weather penetration in heavy rainfall. Frequency band allocation is granted by the ITU, whereas permissions to transmit on given frequencies are granted on a national basis. Each radar will incur a licencing fee.

Modern transmitter and processing technologies allow several radars in close vicinity to transmit on the same frequency without running the risk of disturbing each other. The same techniques provide protection against interference from other radars, e.g. radars onboard ships.

Antenna Parameters

The antenna gain is one of the most important factors determining the radar range. The gain is mainly determined by the operating frequency and the horizontal and vertical beam widths of the antenna array. Narrowing the **horizontal** as well as **vertical** beam widths will result in reduction of the volume clutter and thereby improved performance in precipitation. The **horizontal** beam width Services is also the governing parameter in respect to azimuth resolution and it has significant influence on the amount of surface clutter received. The **vertical** beam characteristics are the governing factor in respect to coverage at short range. Use of **circular polarization** will reduce unwanted returns from precipitation while maintaining good returns from targets of interest to the VTS operator. However, some radar reflectors are specifically designed for **linear polarisation** and their visibility may therefore be reduced by the use of circular polarisation. If small non-metallic targets, such as fibre glass, wooden, rubber or rigid hull inflatable boats, are identified by the VTS as a target of concern, then the selection of antenna polarization is even more complex and should be studied carefully.

Use of high **antenna rotation speed** increases the scan data rate, but the hits per scan (echo returns per scan from a particular target) is decreased correspondingly. In some cases this may mask a weak target that would otherwise be detected by using a lower antenna speed.

Side Lobes

A small part of the radio frequency energy from each transmitted pulse is radiated outside the main antenna beam, producing side lobe patterns whose axis in the horizontal plane have various angles with respect to the main beam.

Side lobes have no effect in case of distant or small surface targets, but the echo from a large target at short range may produce an arc similar to a section of a range ring, or they may appear as a series of echoes forming a dotted arc.

Side lobes may also occur far from the main beam, producing targets that are very difficult to discriminate from real targets. The side lobe levels are entirely dependent on the antenna design. **Far side lobe characteristics** are very important, as side lobes far from the main beam may result in false targets, appearing to the operator with the same characteristics as a valid target.

Transmitter Characteristics

For traditional pulsed radars the average power and peak pulse power has an influence on the detection range. However, its importance is often overestimated. High peak power often results in higher losses in the transmission lines of the radar and it will always result in a larger amount of unwanted information (e.g. sea clutter).Shorter pulse lengths provide better range resolution, a reduction of returns from rain and sea clutter and better overall performance. The use of relatively short pulses (50 to 300 nanoseconds) is often beneficial for VTS applications.

Receiver Characteristics

The receiver sensitivity (often expressed by the receiver noise factor) is one of the main factors with respect to detection of small distant targets in clear weather. The noise figure may be expressed in different terms such as ‘Low Noise Front End (LNFE) noise figure’ and ‘overall noise figure’, making it difficult to compare radars from different vendors.

A better expression for receiver sensitivity is the Minimum Detectable Signal (MDS); however, this is not ideal either as it may be difficult to measure this figure in a reliable manner. The dynamic characteristics are very important, especially if operational conditions require:

- Simultaneous detection of targets on short and long range;
- Supply of signals for more than one display with different range settings;
- Simultaneous supply of signals for different operational roles;
- Supply of signals for automatic video processing and automatic tracking.

Minimum detectable signals at the receiver input and processed onwards lie typically at -90 to - 105 dBm in VTS applications, or may be as low as -115 dBm.

Very large targets at close range are, however, not fully within the beam at short range, limiting the input at the receiver to about + 10 dBm for the typical case. Consequently, the overall dynamic range needed for the individual radar for a VTS application is typically between 100 and 125 dB.

Scanner Types

Pulse compression radars (Cheapest and most used for low to mid end VTS)

For pulse compression radars the pulse compression circuit in the receiver will generate so called ‘time side lobes’ which may appear as weaker, false signals in front of and behind large targets. Special attention should be paid to this effect.

Continuous wave radars

For continuous wave radars similar effects as for pulse compression radars can be observed due to the receiver processing.
In addition, spill-over of energy between transmitting and receiving antennas may limit the useful dynamic range. The use of small antennas allowed by the technology may lead to reduction of azimuth resolution and result in higher susceptibility to rain and sea clutter. Special attention should be paid to those effects

Solid State Radars (High End and has the best of both of the afore mentioned)

Solid State Radars will typically employ Pulse Compression or Continuous Wave techniques.

3. Legal Drivers for Change in Guernsey

The International Convention for the Safety of Life at Sea (SOLAS) has been ratified on behalf of the Island. Regulation 12 of the revised Chapter V of SOLAS requires the contracting government (us) to arrange for the establishment of VTS where, in their opinion, the volume of traffic or the degree of risk justifies such a service. The regulation requires that the contracting government plans and implements VTS where possible following the guidelines developed by the IMO (International Maritime Organistion).

A Statutory Harbour Authority (in this case Guernsey Harbours) is responsible for assessing the need and suitable type of VTS. A formal assessment of navigational risk, as part of the preparation for introduction of the Port Marine Safety Code (PMSC), has identified the need for a VTS in Guernsey.

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) V103 publication recommends minimum standards for training and Certification of VTS personnel. This was introduced in May 1998. These recommendations now form the internationally recognised training requirements for staff that operate such services. The PMSC and Guide to Good Practice also endorse this training.

The States of Guernsey also has legal responsibility for acting in relation to the prevention of pollution. The recent Bailiwick Oil pollution Risk Assessment has also identified a VTS as a future control measure.

One of the recommendations published in The Marine Accident Investigation Branch report into the grounding of Commodore Clipper in July 2014 (Report 18/2015) was for the States of Guernsey to improve the standard of Vessel Traffic Service in the Little Russel as guided by the principles in MGN 401 (**Marine Guidance Notes are issued by the Maritime and Coastguard Agency offering a code of practice on compliance with maritime legislation**. **In the UK, the MCA is the Competent Authority for VTS. In Guernsey, Guernsey Harbours is the Competent Authority. Since we are a small authority we follow the UK guidelines as best practice where applicable).** The introduction of a VTS information service would be conducted in tandem with a review of Guernsey's pilotage arrangements that were also criticised in the report.

4. Risk Assessments

PMSC RISK ASSESSMENT								COMMERCIAL VESSELS TRANSITING THE LITTLE RUSSEL WITHOUT PILOT					
Date: 7th April 2015	Assessor: Jerome Davis						Signature						
HAZARD	RISK	RISK SEVERITY (1-5)					EXISTING CONTROL MEASURES IN PLACE	LIKELIHOOD NOW (1 - 5)	RISK FACTOR (1 -25)	CAN RISK BE RED. FURTHER Y/N	FURTHER CONTROLS NECESSARY / RECOMMENDED	LIKELIHOOD AFTER (1-5)	RESIDUAL RISK FACTOR (1 - 25)
		PEOPLE	ENVIRONMENT	ASSETS	BUSINESS	TOTAL							
LACK OF LOCAL KNOWLEDGE	COLLISION	✓	✓		✓	5	Vessels have certificated crew and Bridge team ~ Local Regulations and Nav warnings published~ Nav Aids in place and maintained ~ Periodic Surveys~24 hr Port Control ~RNLI/SJA/AS1 based in Guernsey	2	10	Y	Consider implementation of VTS organisation~ Consider lowering LOA for compulsory pilot.	1	5
	GROUNDING	✓	✓		✓	5		2	10	Y		1	5
	CONTACT WITH NAV. MARK	✓	✓	✓	✓	3		1	3	N		1	3
MECHANICAL FAILURE OF VESSEL EQUIPMENT	COLLISION	✓	✓		✓	5	Vessels have certificated crew and Bridge team ~ Local Regulations and Nav warnings published~ Nav Aids in place and maintained ~ Periodic Surveys~24 hr Port Control ~RNLI/SJA/AS1 based in Guernsey	1	5	N	Consider implementation of VTS organisation~ Consider lowering LOA for compulsory pilot.	1	5
	GROUNDING	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N		1	3
REDUCED VISIBILITY	COLLISION	✓	✓		✓	5	Vessels have certificated crew and Bridge team ~ Local Regulations and Nav warnings published~ Nav Aids in place and maintained ~ Periodic Surveys~24 hr Port Control ~RNLI/SJA/AS1 based in Guernsey	2	10	Y	Consider implementation of VTS organisation~ Consider lowering LOA for compulsory pilot.	1	5
	GROUNDING	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK	✓	✓	✓	✓	3		1	3	N		1	3
LOSS OF HULL INTEGRITY	COLLISION	✓	✓		✓	5	Vessels have certificated crew and Bridge team ~ Local Regulations and Nav warnings published~ Nav Aids in place and maintained ~ Periodic Surveys~24 hr Port Control ~RNLI/SJA/AS1 based in Guernsey	2	10	N	Consider implementation of VTS organisation~ Consider lowering LOA for compulsory pilot.	1	5
	GROUNDING	✓	✓		✓	5		2	10	N		1	5
	CONTACT WITH NAV. MARK	✓	✓	✓	✓	5		1	5	N		1	5
OIL POLLUTION AS RESULT OF COLLISION/GROUNDING	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	5	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places	2	10	Y	Exercise Oil Spill Response	1	5
OIL POLLUTION AS RESULT OF CONTACT WITH NAV MARK	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	4	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places	2	8	Y	Exercise Oil Spill Response	1	4
REVIEW DATE:		REVIEWED BY:											

PMSC RISK ASSESSMENT								COMMERCIAL VESSELS BERTHING - ST SAMPSON'S					
Date 30/03/2015	Assessor Jerome Davis						Signature						
HAZARD	RISK	RISK SEVERITY (1-5) PEOPLE	ENVIRONMENT	ASSETS	BUSINESS	TOTAL	EXISTING CONTROL MEASURES IN PLACE	LIKELIHOOD NOW (1 - 5)	RISK FACTOR (1 -25)	CAN RISK BE RED. FURTHER Y/N	FURTHER CONTROLS NECESSARY / RECOMMENDED	LIKELIHOOD AFTER (1-5)	RESIDUAL RISK FACTOR (1 - 25)
PILOTAGE PASSAGE INTO ST SAMPSON'S HARBOUR	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Compulsory pilot for all commercial vessels entering St Sampson's Hbr ~ Vessels have certificated crew and Bridge team to support pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info (inc. confirmation of draft and expected UKC) ~ Local Regulations and Nav warnings published.	1	5	N	Provision of local anemometer for wind speed in St Sampson's ~ Provision of local, accurate tide gauge for St Sampson's~ UKHO to re-issue Dec 2014 charts~ Request UKHO to produce large scale chart of St Sampson's ~ Improve pier head lighting~ Vessels with a Master who has not berthed in SS before to be met by the pilot at anchor and thouroughly briefed before weighing anchor and proceeding ~ Consider implementing a VTS organisation ~ Consider lowering LOA threshold for BTU requirement. Develop legal powers for the pilot launch to act as a safety escort. Improve "traffic light" system to a clearly visible, IALA type.	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		2	10	Y		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	5		2	10	Y		1	5
MECHANICAL FAILURE OF VESSEL EQUIPMENT	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessel under pilotage ~ Master to confirm vessel condition on boarding and report deficiencies to pilot ~ Abort positions on passage plan ~ Anchors available	1	5	N	NONE	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	5		1	5	N		1	5
REDUCED VISIBILITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessels are under authorised pilotage ~ Vessels have certificated crew and Bridge team to support pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info ~ Local Regulations and Nav warnings published ~ Pilots will assess the visibility and suspend pilotage as neccessary ~ Pilot launch used as a safety escort	2	10	Y	Consider implementing VTS organisation. Develop legal powers for the pilot launch to act as a safety escort. Improve "traffic light" system to a clearly visible, IALA type.	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	5		1	5	N		1	5
LOSS OF HULL INTEGRITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessel under pilotage ~ Master to confirm vessel condition on boarding and report deficiencies ~ Abort positions identified on passage plan ~ Anchors available ~ NAABSA VESSELS ONLY ~ berth inspected at low water before vessels arrival ~ harbour bottom repaired/maintained as required	1	5	N	Deveopment of deepwater berth or SPM for hydrocarbon supply (long term solution +/-2017)	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	TAKING THE HARBOUR BOTTOM ALONGSIDE		✓	✓	✓	5		2	10	Y			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	5		1	3	N		1	5
POLLUTION AS A RESULT OF TAKING THE HARBOUR BOTTOM ON THE BERTH	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	5	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~ NAABSA VESSELS ONLY ~ Berth inspected/repaired prior to arrival ~ Compulsory authorised pilot	3	15	Y	Deveopment of deepwater berth or SPM for hydrocarbon supply (long term solution +/-2017) ~ Annual Oil Spill Exercise		
OIL POLLUTION AS RESULT OF COLLISION/GROUNDING	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	5	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~Compulsory pilot for all commercial vessels entering St Sampson's Hbr ~ Vessels have certificated crew and Bridge team to support pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info (inc. confirmation of draft and expected UKC) ~ Local Regulations and Nav warnings published ~ "traffic light" system~ pilot lanch to act as safety escort to warn off small craft	3	15	Y	Annual Oil Spill Exercise with boom deployment ~ Develop deep water berth	1	5
OIL POLLUTION AS RESULT OF CONTACT WITH NAV MARK/QUAY	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	5	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~Compulsory pilot for all commercial vessels entering St Sampson's Hbr ~ Vessels have certificated crew and Bridge team to support pilot ~ Vessel and pilot have Passage plan to berth	3	15	Y	Annual Oil Spill Exercise with boom deployment ~ Develop deep water berth	1	5
REVIEW DATE:		REVIEWED BY:											

PMSC RISK ASSESSMENT								INWARD/OUTWARD PASSAGE OF FERRIES & CAROGO VESSELS - St PETER PORT					
Date: 14th April 2015	Assessor: Jerome Davis						Signature						
HAZARD	RISK	RISK SEVERITY (1-5) PEOPLE	ENVIRONMENT	ASSETS	BUSINESS	TOTAL	EXISTING CONTROL MEASURES IN PLACE	LIKELIHOOD NOW (1 - 5)	RISK FACTOR (1 -25)	CAN RISK BE RED. FURTHER Y/N	FURTHER CONTROLS NECESSARY / RECOMMENDED	LIKELIHOOD AFTER (1-5)	RESIDUAL RISK FACTOR (1 - 25)
LACK OF LOCAL KNOWLEDGE	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessels are either under authorised pilotage or Special Pilot Statuus ~ Vessels have certificated crew and Bridge team to support pilot/special pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info ~ Local Regulations and Nav warnings published ~ Depths surveyed and maintained	2	10	Y	Consider implementation of VTS organisation	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N		1	3
MECHANICAL FAILURE OF VESSEL EQUIPMENT	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessel under pilotage/special pilot ~ Master to confirm vessel condition and report deficiencies ~ Abort positions identified on passage plan ~ Anchors available	1	5	N	Consider implementation of VTS organisation	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N		1	3
REDUCED VISIBILITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessels are either under authorised pilotage or special pilot ~ Vessels have certificated crew and Bridge team to support pilot/special pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info ~ Local Regulations and Nav warnings published	2	10	Y	Consider implementation of VTS organisation	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N		1	3
LOSS OF HULL INTEGRITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessel under pilotage/special pilot ~ Master to confirm vessel condition on boarding and report deficiencies ~ Abort positions identified on passage plan ~ Anchors available	1	5	N	NONE	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	5		1	5	N		1	5
OIL POLLUTION AS RESULT OF COLLISION/GROUNDING	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	5	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places	2	10	Y	Exercise Oil Spill Response	1	5
OIL POLLUTION AS RESULT OF CONTACT WITH NAV MARK/QUAY	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	4	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places	2	8	Y	Exercise Oil Spill Response	1	4
REVIEW DATE:		REVIEWED BY:											

PMSC RISK ASSESSMENT		TITLE: COLLISION OF ALL COMMERCIAL VESSELS										No.	
Date: 14th April 2015	Assessor: Jerome Davis	TAG					Signature						
HAZARD	RISK	RISK SEVERITY (1 -5)					EXISTING CONTROL MEASURES IN PLACE	LIKELIHOOD NOW (1 - 5)	RISK FACTOR (1-25)	CAN RISK BE FURTHER REDUCED Y/N	FURTHER CONTROLS NECESSARY /RECOMMENDED	LIKELIHOOD AFTER (1-5)	RESIDUAL RISK FACTOR (1-25)
		PEOPLE	ENVIRONMENT	ASSETS	BUSINESS	TOTAL							
Vessel striking another vessel	Injury/Fatality to persons on board both vessels.	✓	✓		✓	5	Vessels are either under authorised pilotage or special pilot ~ Vessels have certificated crew and Bridge team to support pilot/special pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info ~ Local Regulations and Nav warnings published~ RNLI based at SPP along with SJA's Flying Christine	2	10	Y	Consider implementation of VTS organistation	1	5
Vessel striking port infrastructure	Injury/Fatality to persons on board vessel and shore facility	✓	✓	✓	✓	5	Vessels are either under authorised pilotage or special pilot ~ Vessels have certificated crew and Bridge team to support pilot/special pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info ~ Local Regulations and Nav warnings published~ RNLI based at SPP along with SJA's Flying Christine	2	10	N		2	10
Vessel striking navigation mark	Injury/Fatality to persons on board	✓	✓	✓	✓	5	Vessels are either under authorised pilotage or special pilot ~ Vessels have certificated crew and Bridge team to support pilot/special pilot ~ Vessel and pilot have Passage plan to berth ~ Master/Pilot exchange of info ~ Local Regulations and Nav warnings published~ RNLI based at SPP along with SJA's Flying Christine	2	10	N		2	10
Consequential damage to vessel	Loss of hull integrity	✓	✓		✓	5	Certificated ship's crew, use of watertightdoors, pumps, shoring & damage control.RNLI based at SPP.	1	5	N		1	5
	Oil pollution		✓	✓	✓	3	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places	2	10	Y	Exercise Oil Pollution Response	1	5
	Obstruction to port			✓	✓	4	Alternative berthing arrangements possible. States wide buisness continuity plan.	2	8	N		2	8
Consequential damage to shore facility	Loss of use of facility			✓	✓	3	Alternative berthing arrangements possible. In house maintenance team.	2	6	N		2	6
Consequential damage to Navmark	Loss of use of Navmark			✓	✓	2	In house maintenance team. Nav warnings published.	2	4	N		2	4
REVIEW DATE:	REVIEWED BY:			SIGNATURE:									

PMSC RISK ASSESSMENT								INWARD/OUTWARD PASSAGE OF LEISURE VESSELS UNDER PILOTAGE LENGTH				No.	
Date: 17th April 2015	Assessor: Jerome Davis						Signature						
HAZARD	RISK	RISK SEVERITY (1 - 5)					EXISTING CONTROL MEASURES IN PLACE	LIKELIHOOD NOW (1 - 5)	RISK FACTOR (1 -25)	CAN RISK BE RED. FURTHER Y/N	FURTHER CONTROLS NECESSARY / RECOMMENDED	LIKELIHOOD AFTER (1-5)	RESIDUAL RISK FACTOR (1 - 25)
		PEOPLE	ENVIRONMENT	ASSETS	BUSINESS	TOTAL							
LACK OF LOCAL KNOWLEDGE	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Local Regulations and Nav warnings published ~ Free information booklets available ~ Safety & Navigation Advice on website ~ Port Control monitoring 24/7 ~ RNLI & Air Search available localy	2	10	Y	Consider Implementing VTS Organisation	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		2	10	Y		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	Y			
MECHANICAL FAILURE OF VESSEL EQUIPMENT	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Local Regulations and Nav warnings published ~ Free information booklets available ~ Safety Advice on website ~ Port Control monitoring 24/7 ~ RNLI & Air Search available localy ~ Awareness initiatives	1	3	N			
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		2	10	N			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		2	10	N			
REDUCED VISIBILITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Local Regulations and Nav warnings published ~ Free information booklets available ~ Safety Advice on website ~ Port Control monitoring 24/7 ~ RNLI & Air Search available localy ~ Awareness initiatives ~ Controlled access/egress from marinas	2	10	Y	Consider Implementing VTS Organisation	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		2	10	Y		1	5
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		2	6	Y		1	3
LOSS OF HULL INTEGRITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Safety & Navigation Advice on website ~ Port Control monitoring 24/7 ~ RNLI & Air Search available localy	1	5	N			
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	5		1	5	N			
OIL POLLUTION AS RESULT OF COLLISION/GROUNDING	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	4	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~ Small quantities	2	8	Y	Exercise Oil Pollution Response		
OIL POLLUTION AS RESULT OF CONTACT WITH NAV MARK/QUAY	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	3	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~ Small quantities	1	3	Y	Exercise Oil Pollution Response		
REVIEW DATE:		REVIEWED BY:											

PMSC RISK ASSESSMENT								INWARD/OUTWARD PASSAGE OF REGISTERED FISHING VESSELS				No.	
Date: 6th May 2015	Assessor: Jerome Davis						Signature						
HAZARD	RISK	RISK SEVERITY (1 - 5)					EXISTING CONTROL MEASURES IN PLACE	LIKELIHOOD NOW (1 - 5)	RISK FACTOR (1 -25)	CAN RISK BE RED. FURTHER Y/N	FURTHER CONTROLS NECESSARY / RECOMMENDED	LIKELIHOOD AFTER (1-5)	RESIDUAL RISK FACTOR (1 - 25)
		PEOPLE	ENVIRONMENT	ASSETS	BUSINESS	TOTAL							
LACK OF LOCAL KNOWLEDGE	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Local Boats registered to Baliwick Citizens ~ Compulsory training requirements ~ Compulsory safety standards with periodic inspections ~ Publication of nav warnings and local notices to mariners ~ Port Control 24/7	2	10	Y	Consider implementation of VTS organisation	1	5
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N			
MECHANICAL FAILURE OF VESSEL EQUIPMENT	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Compulsory training requirements ~ Compulsory safety standards with periodic inspections ~ Port Control 24/7 ~ RNLI based in SPP	1	5	N			
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N			
REDUCED VISIBILITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Vessels without radar advised not to sail in restricted vis~ Compulsory training requirements ~ Compulsory safety standards with periodic inspections ~ Port Control 24/7 ~ RNLI based in SPP	1	5	N			
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	5		1	5	N			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N			
LOSS OF HULL INTEGRITY	COLLISION IN PILOTAGE AREA	✓	✓		✓	5	Compulsory training requirements ~ Compulsory safety standards with periodic inspections ~ Port Control 24/7 ~ RNLI & Air Search based locally	1	5	N			
	GROUNDING IN PILOTAGE AREA	✓	✓		✓	4		1	4	N			
	CONTACT WITH NAV. MARK/QUAY	✓	✓	✓	✓	3		1	3	N			
OIL POLLUTION AS RESULT OF COLLISION/GROUNDING	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	4	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~ Small quantities	2	8	Y	Exercise Oil Pollution Plan	1	4
OIL POLLUTION AS RESULT OF CONTACT WITH NAV MARK/QUAY	ENVIRONMENTAL /PROPERTY DAMAGE		✓	✓	✓	4	Oil Pollution Contingency plan in place ~ Oil spill kits sited in strategic places ~ Small quantities	2	8	Y	Exercise Oil Pollution Plan	1	4
REVIEW DATE:		REVIEWED BY:											

Extract from: Risk Assessment for Marine Oil Pollution in Channel Islands Waters – October 2015

Further Treatment Options

The risk assessment team identified a number of possible actions to further treat the risk and improve the control effectiveness, these were:

Guernsey & Jersey

Joint assessment of Channel Islands resources

Exercise / training

Channel Islands co-operation agreement & plan

SARIS module for drift prediction

Formalise French arrangements for assistance

Guernsey

VTS

Pilotage organisation – requirement for pilot to be on specific vessels

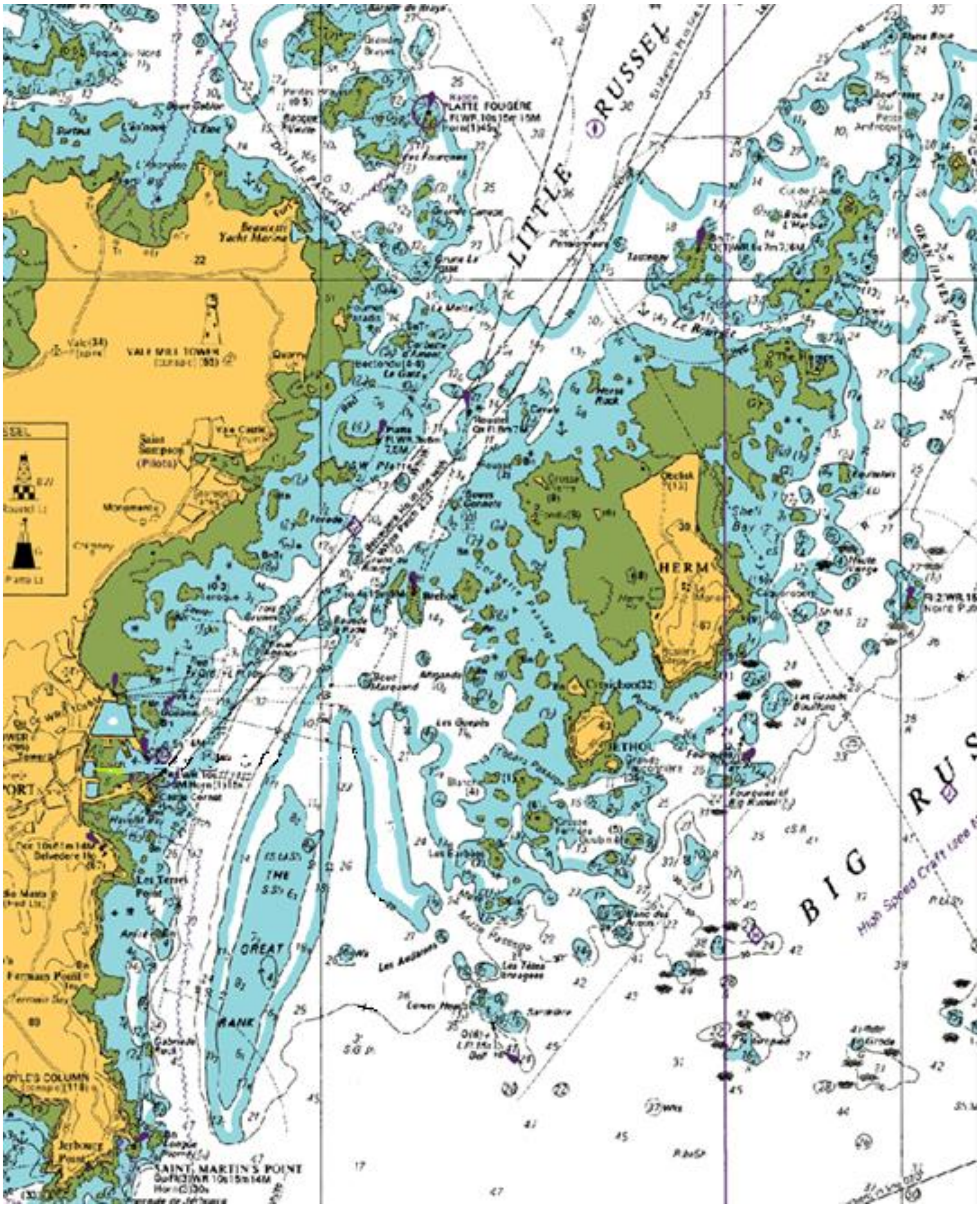
Hydrocarbon supply strategy

Test current equipment capability

Jersey

Conduct needs assessment on dispersant stock and equipment

5. The Little Russel

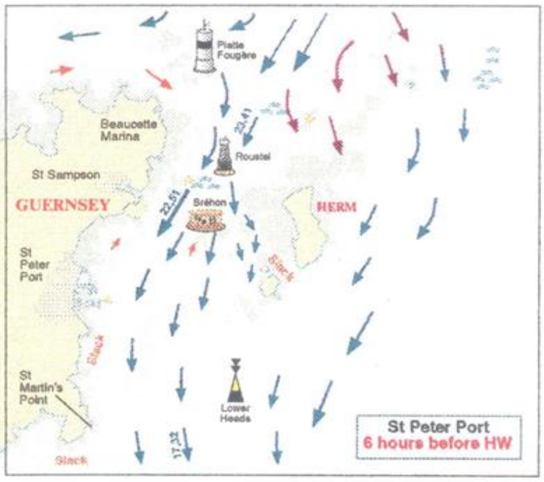


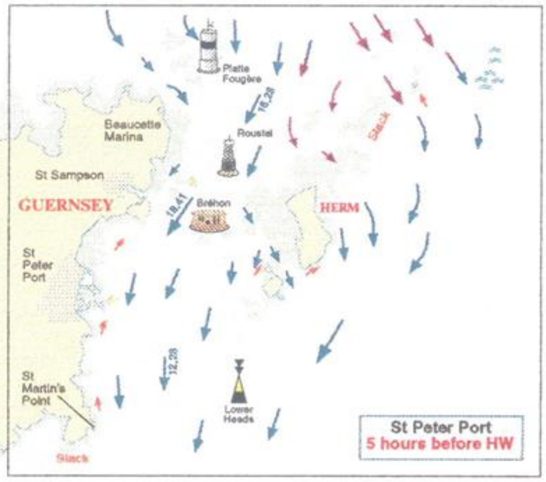
"Little Russel, the channel between Guernsey and Herm, is much constricted by the reefs and dangers extending from, and lying off, the coasts of these islands.
There are depths of 45m in both entrances to Little Russel, but in the narrowest part of the channel there are a number of rocky shoals with depths considerably less than 10m over them. The most significant of these rocky shoals is probably Grune au Rouge, two rocks with a least depth of 4m over them, which lie mid-channel 6.5 cables SSW of Platte Rock Light Beacon and only 0.5 cables NW of the principle leading line by day through the Little Russel."

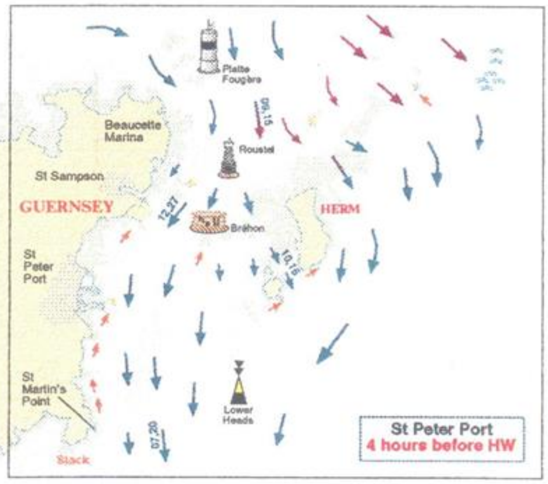
Admiralty Publication – Channel Pilot (27)

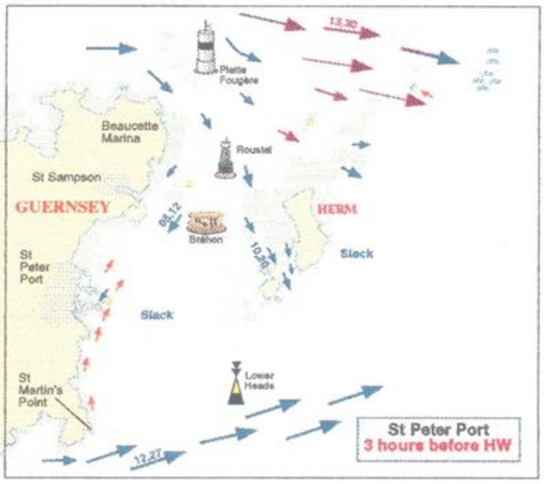
The Little Russel can be a very challenging area to navigate. Strong and complicated tidal streams, large tidal ranges with numerous outcrops, rocks, pinnacles and banks coupled with high levels of pleasure craft and inter-island traffic can make transiting the area difficult, even for experienced mariners. The Royal Navy often use the area for training Frigate Navigators because the Little Russel meets their needs for a complicated passage requiring considerable pre-planning for a successful outcome.

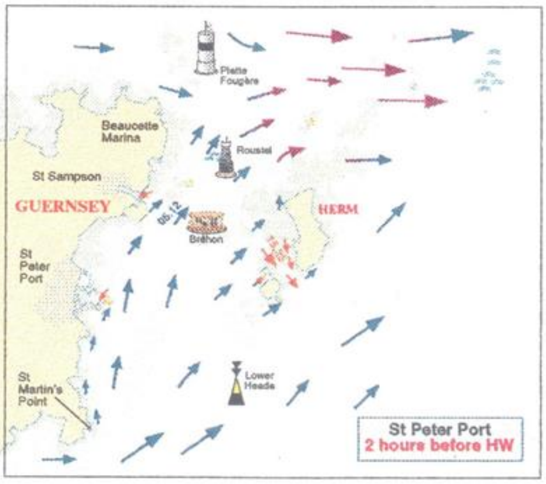
6. Tidal Streams & Traffic Density

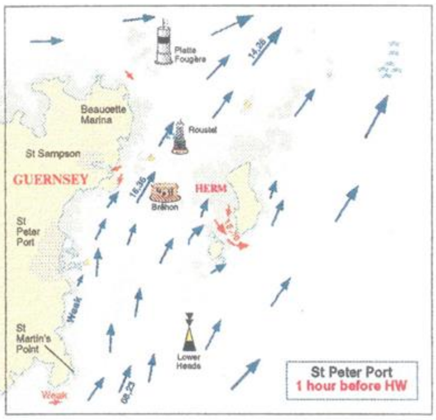


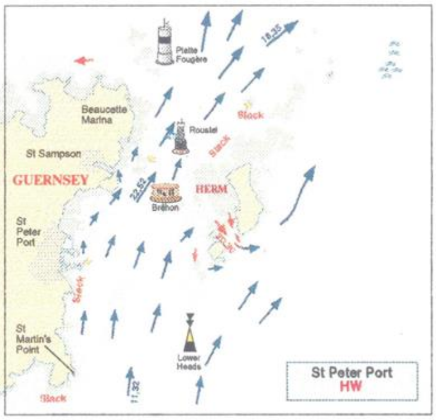









Platte Fougère
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
1 hour before HW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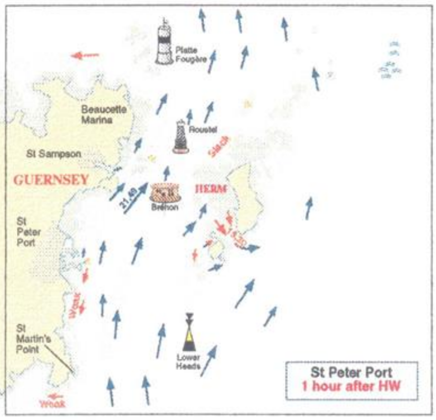
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
HW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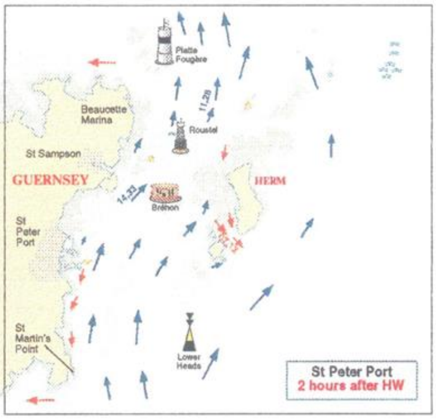
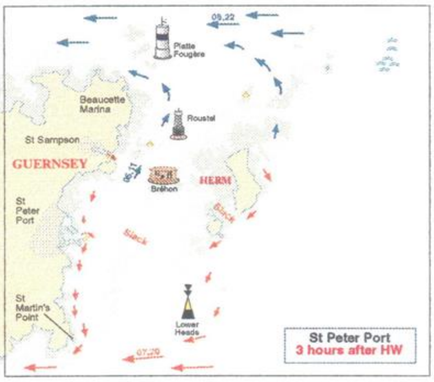
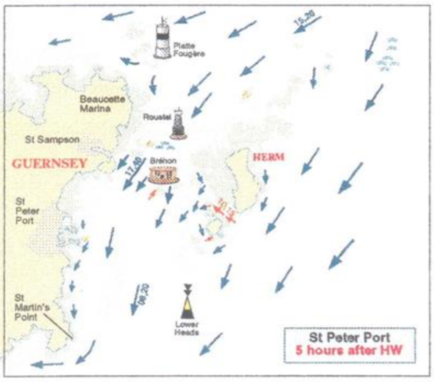
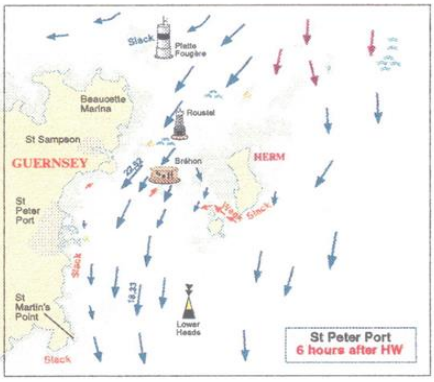
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
1 hour after HW


Platte Fougère
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
2 hours after HW


Platte Fougère
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
3 hours after HW


Platte Fougère
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
4 hours after HW


Platte Fougère
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
5 hours after HW

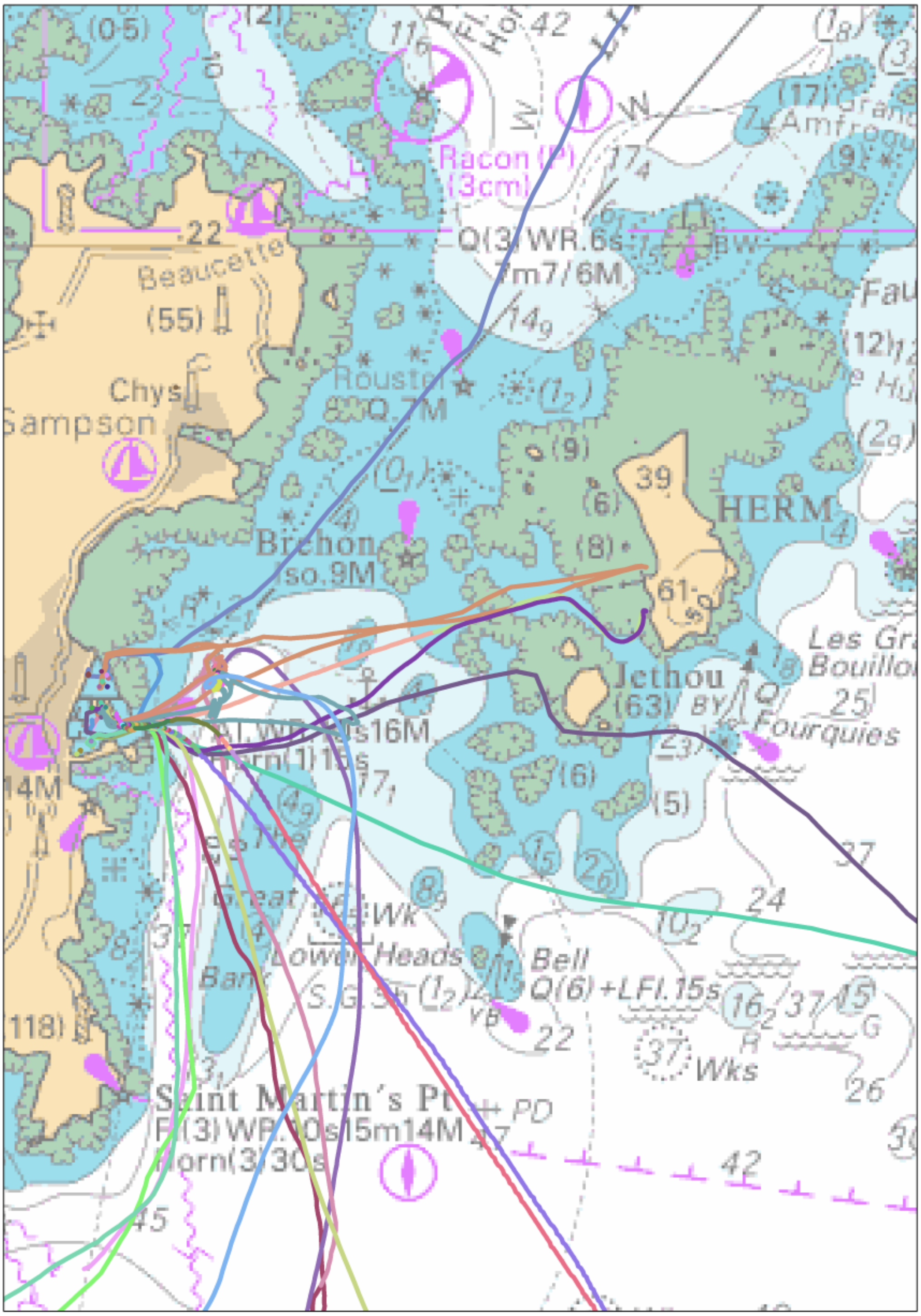

Platte Fougère
Beaucette Marina
Roustel
St Sampson
GUERNSEY
Brehon
HERM
St Peter Port
St Martin's Point
Lower Heads
St Peter Port
6 hours after HW

Traffic Density

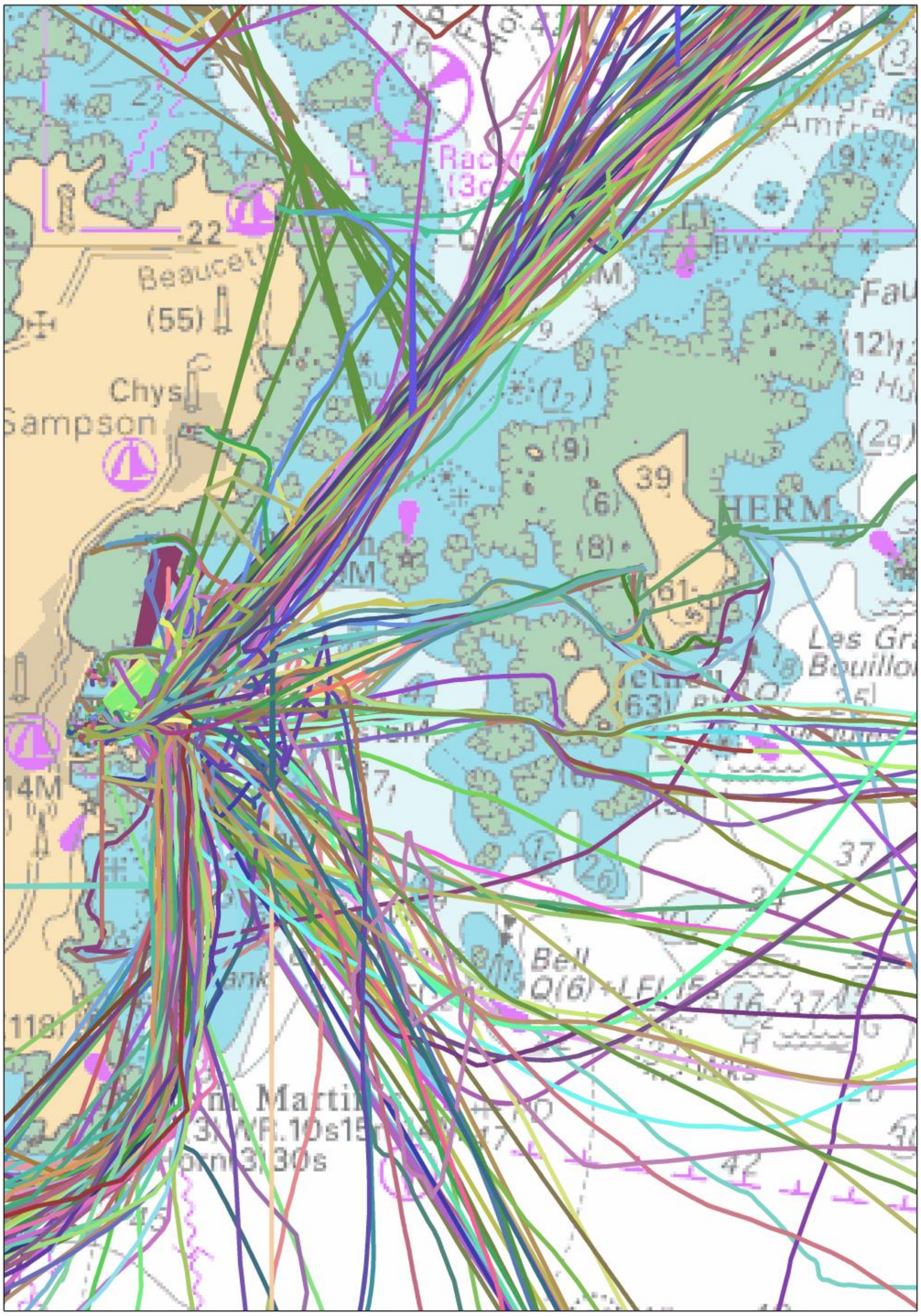
The density of traffic fluctuates greatly between seasons, peaking in August and at its quietest in January. The traffic picture is made up of daily UK and French ferry movements (including high speed ferries), visiting cruise ships and their associated tenders, general cargo ships, hydrocarbon tankers, inter-island ferries, fishing boats and leisure craft of all kinds.

To illustrate this, below, there are four AIS track captures from a 24 hour period in March, June, August and October of 2015. The images demonstrate the seasonal fluctuations in traffic density and indicate just how busy the area becomes during the summer. It is also worth considering that the majority of small pleasure craft are not equipped with AIS and, therefore, the actual traffic picture during the summer months will be more congested.

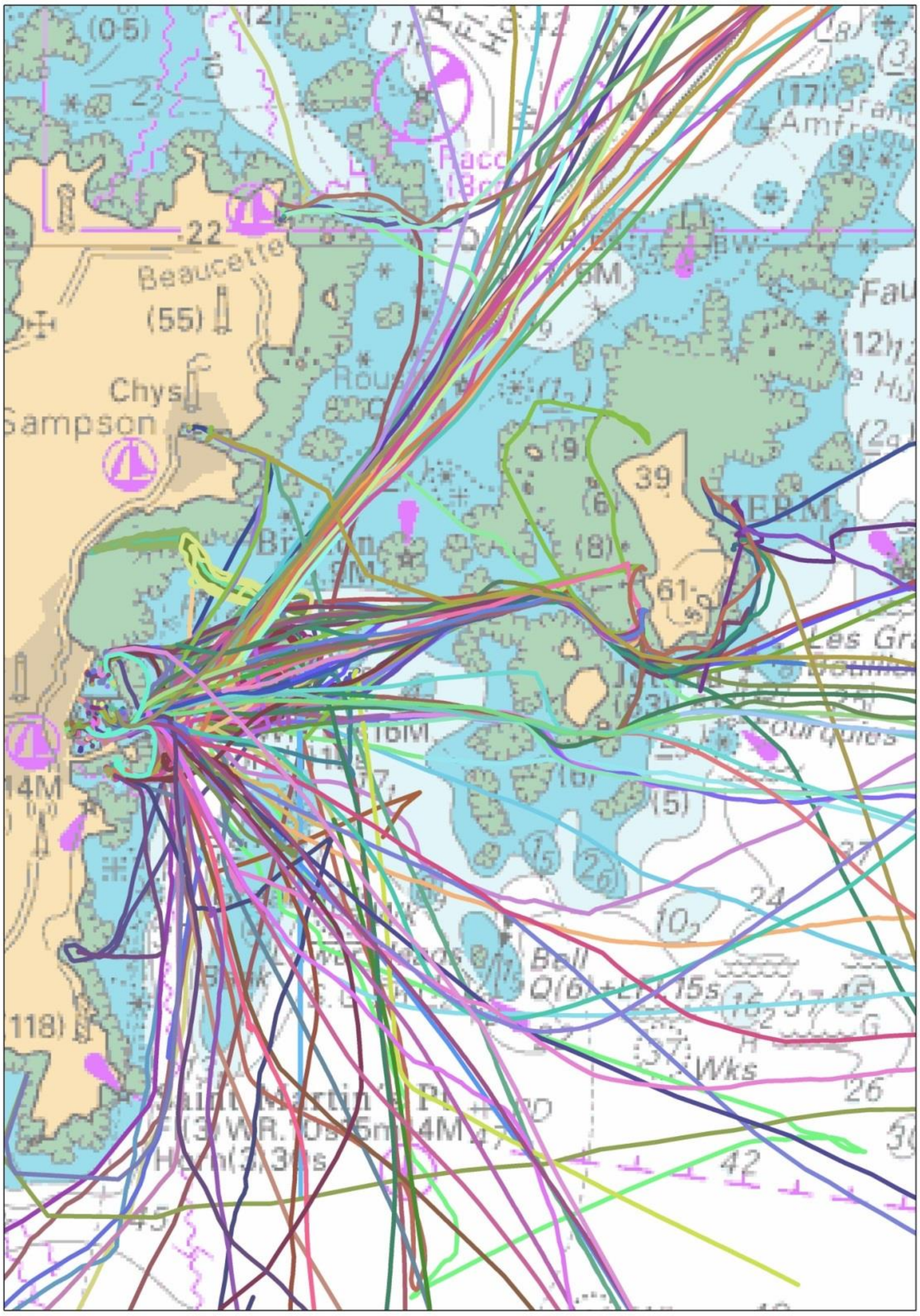
8/3/15



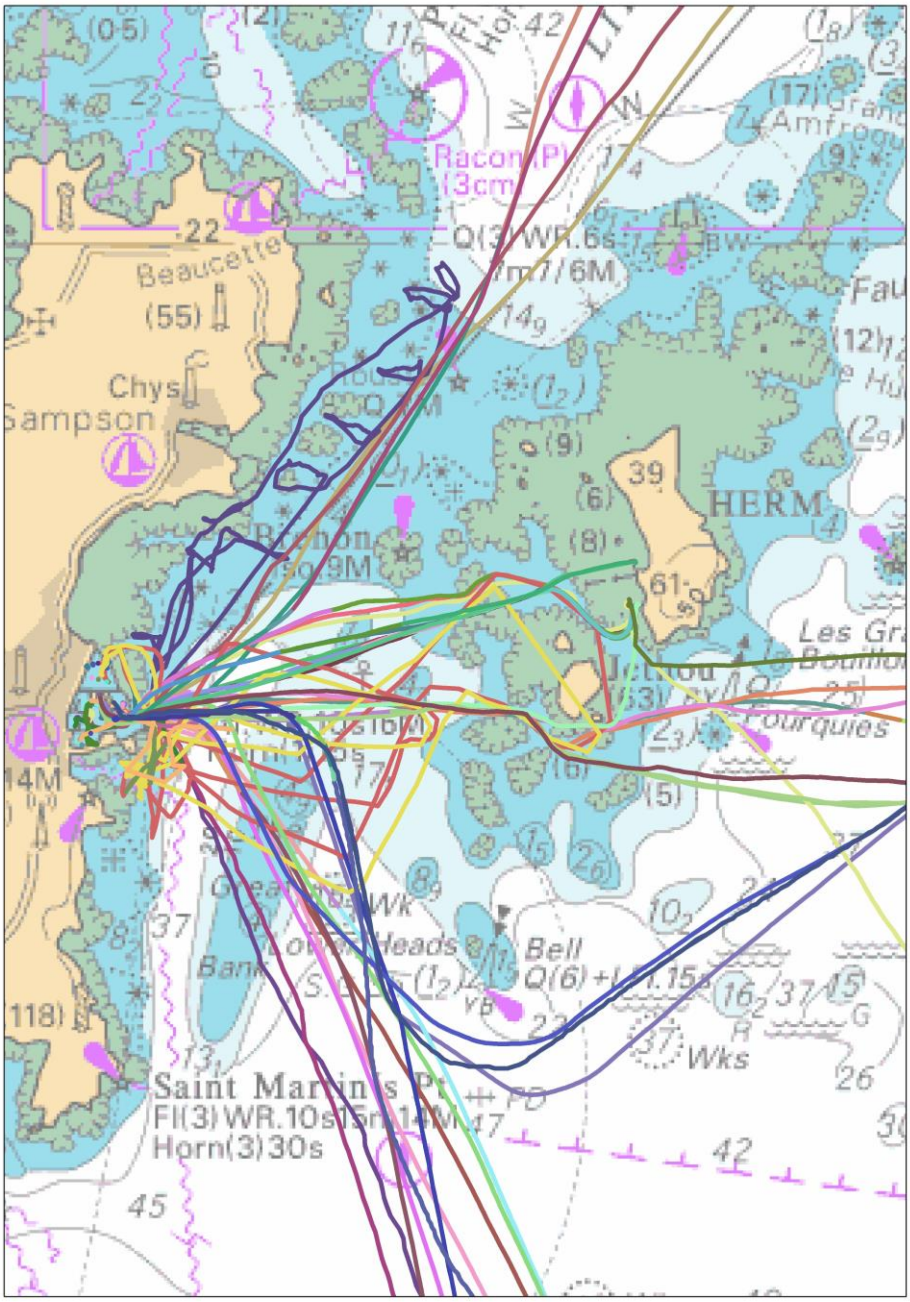
20/6/15



02/8/15



10/10/15

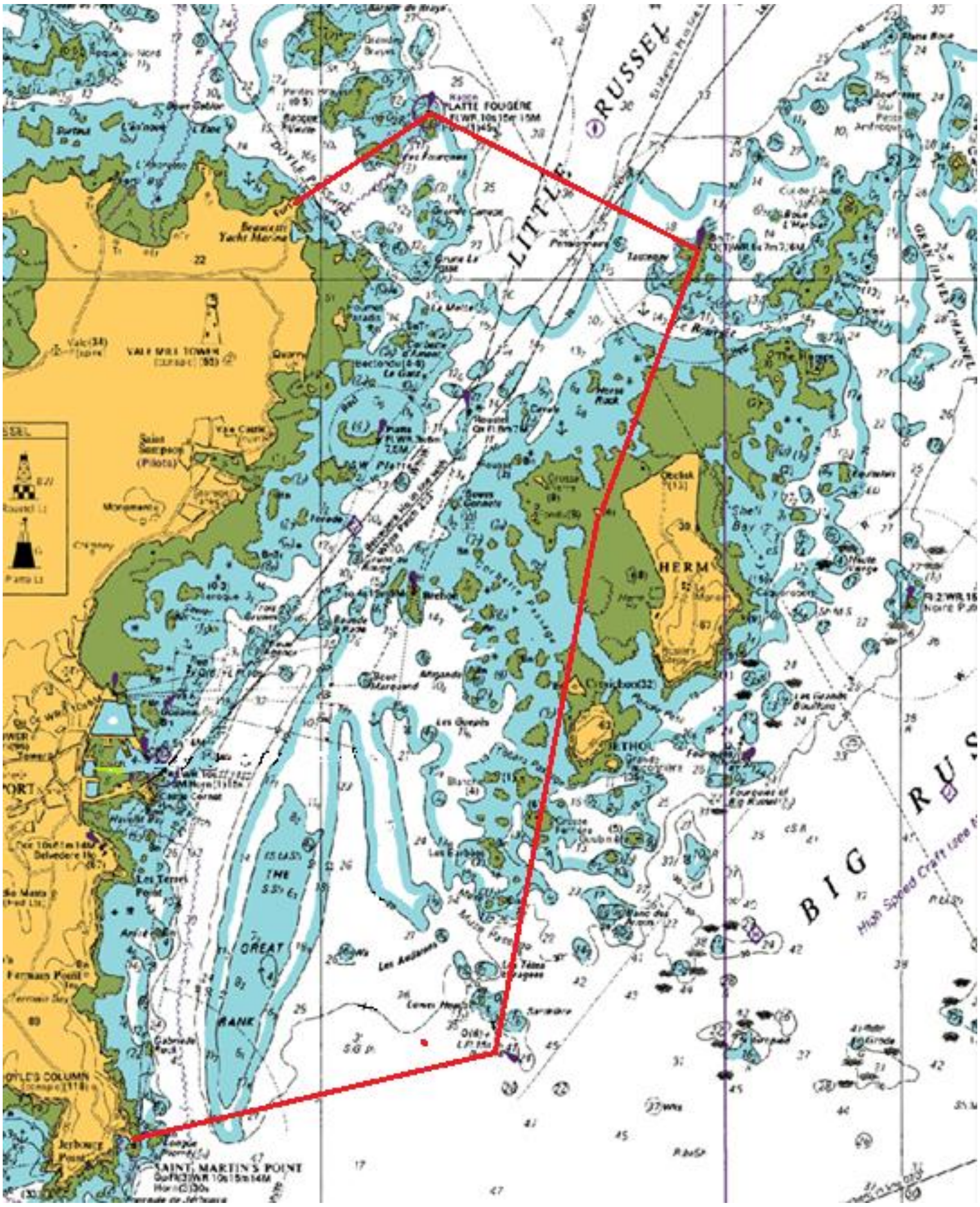


Benchmarking Using Jersey

- Jersey implemented a VTS in 2008 but only completed uprating their staff to V/103 standard in 2014.
- The south coast of Jersey does not have navigational hazards comparable with the Little Russel.
- Jersey only has a fraction of Guernsey's cruise ship trade and inter-island traffic.
- The hydrocarbon berths in Jersey are readily accessible and do not dry out.

7. VTS Area & Radar Site Selection

The proposed Guernsey VTS area would approximately mirror the existing pilotage limits. A change in legislation would be required to extend the harbour limits to this area. By doing so it would enable Guernsey VTS to gain positive control of traffic within the Little Russel, monitoring movements, speeds, potential conflicts and providing an excellent additional tool for emergency and SAR incidents.



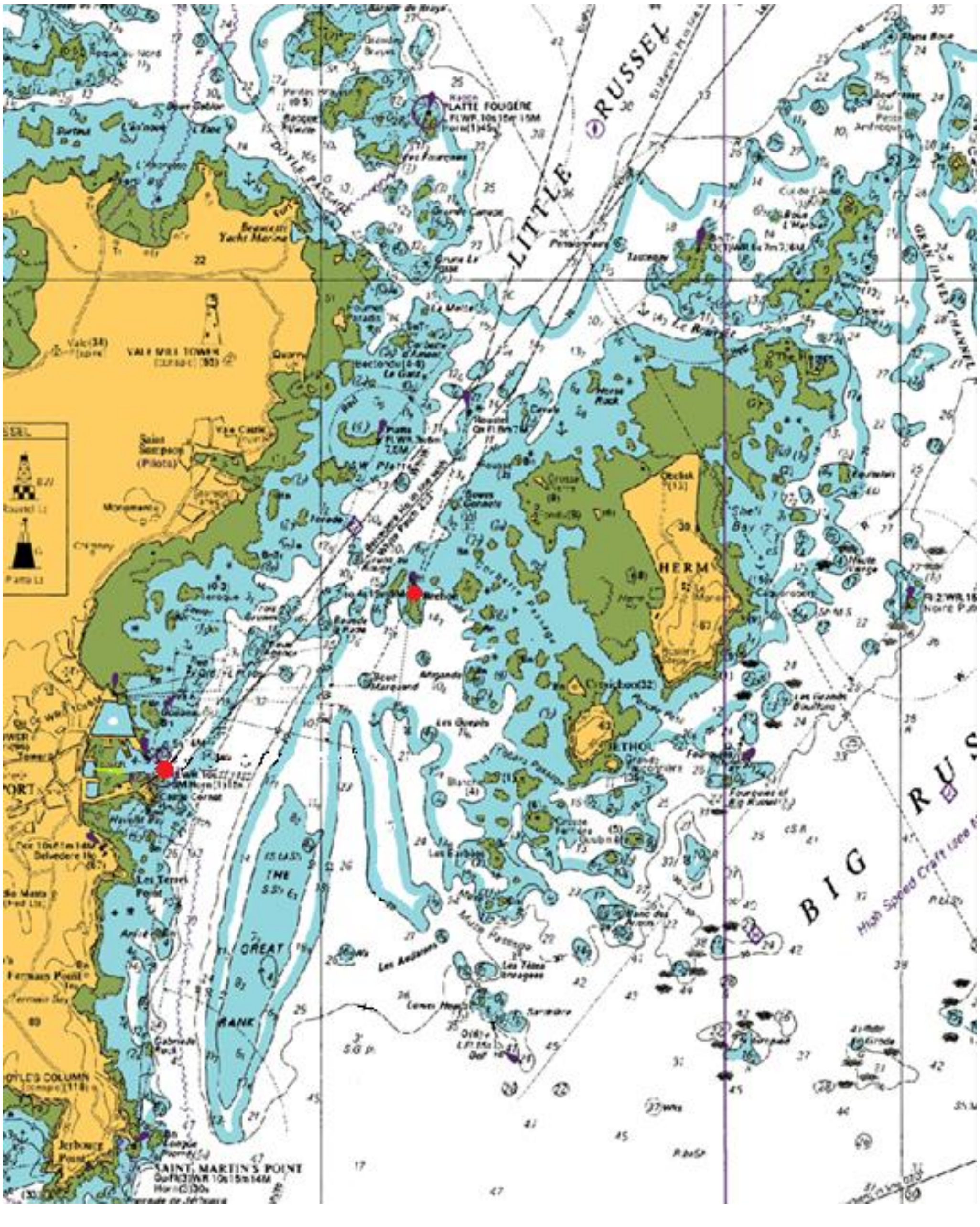
Potential Radar Site Locations

Brehon Tower

A single scanner on Brehon Tower would provide excellent coverage to the north and south of the area with the provision of a small mast. However, permission for utilising the tower may be difficult to obtain and a microwave link would be broken by larger vessels so hard wiring or additional receivers may be required to mitigate this. A suitable power supply and maintenance access could also be problematic.

Castle Breakwater

A single scanner on Castle Breakwater would also provide good coverage of the Little Russel but detection would be restricted on smaller vessels close to the harbour entrance. The scanner could be housed ender the light canopy if it were replaced with a fibreglass replica and links to the Signal Station would be more straightforward



LITTLE RUSSEL
DOYLE PASSAGE
Beaucette Yacht Marina
VALE MILL TOWER
HERM
JETHOU
THE GREAT BANK
BIG RUSSEL
SAINT MARTIN'S POINT
Fermain Point
Jerbourg Point
High Speed Craft

8. Equipment and Costing.

The radar scanner heads required to give a fully compliant radar image to IALA V128 standards are very costly, there are cheaper radars that would provide a very good VTS image but fall below the standards for V128. This does not mean that the radar is no good for VTS, just that it is not compliant with IALA. Many ports in the UK and abroad use non-compliant radar within their VTS system. To have the low end non compliant system would cost around £10,000 per radar scanner plus and additional £20,000 for the processing equipment. A V128 compliant radar scanner would cost around £110,000+.

As an *example*, Furuno are currently fitting a simple system for City of Bristol consisting of a single scanner, processing until, two screens, AIS overlay and a record/playback facility. Furno's local agent is RES.

DRS12A Modified for coastal monitoring (inc. power supply) - £6000
Coastal Monitoring Radar License - £15000
Coastal Monitoring Server - £3500
AIS Receiver - £200
Record and Replay - £10000
Lattice Mast (if required) - £1000 per meter height
Microwave Link - £2000
Installation and training- £3500

Total = +/-£40500

9. Control Room

Funding has been identified for a replacement signal station/control room in the 10 year business plan. A business case will be developed in the near future for this project.

The replacement Signal Station should be of such design as to accommodate the VTS Operators, associated equipment, maximise visibility of the Little Russel and Harbour and have the option of providing office accommodation for operational staff with an Emergency Planning Room.

10. Funding

Consideration should be given to the issue of how the future VTS should be funded. It is recommended during the project that a consistent policy is developed on VTS funding, as this service is an integral part of the local navigation infrastructure. Preferably the funding should be in accordance with the IALA Recommendation V-102 on Guidelines on the Application of 'User Pays' Principle to VTS. The intention when introducing a VTS is to enhance the existing situation, therefore, the previous infrastructure should be reassessed to identify those parts that may be retained and those that might become obsolete upon introduction of the future system.

11. Staffing and Training

Staff Training Costs

As a guide Port of London (PoL) conduct VTS – V103 training, at their Gravesend facility, at a cost of £3800 for a candidate with a maritime background. Pricing per candidate will fluctuate depending on what additional training is required (radar, GMDSS etc.)

When Jersey made the transition to VTS, PoL carried out the classroom element of the training in Jersey which saved considerably on costs and allowed Jersey to make a "bulk" booking. However, Jersey have advised that training for their staff averaged at +/-£9000 per person when additional training, travel and accommodation were taken into account.

Refresher training is also required every 3 to 5 years at a cost of +/-£3500 per person.

VTS training is also provided by South Tyneside College.

St Helier VTS/Jersey Coastguard

As a bench mark, St Helier VTS maintain their functions using 9 staff with the overnight period single manned..

APRIL 2015		SMO AM 0630-1400	SMO PM 1345-2200	SMO U	MO AM 0700-1900	MO PM 1900-0700	MO U	SMO	MO
1st Wed	14	Jamie	Bjorn	Robin	Alex	Richard	~~Richard~~		Tim
2nd Thu	14	Jamie	Bjorn	Robin	Jono	Alex	~~Richard~~		
3rd Fri	14	Bjorn	Louise		Jono	Alex			
4th Sat	14	Bjorn	Louise		Dan	Jono			
5th Sun	14	Louise	Jamie		Dan	Jono			
6th Mon	15	Louise	Jamie		Richard	Dan			Tim
7th Tue	15	Jamie	Robin	~~Robin~~	Richard	Dan	~~Richard~~	Bjorn	Tim
8th Wed	15	Jamie	Robin	~~Robin~~	Alex	Richard	~~Richard~~	Bjorn	Tim
9th Thu	15	Robin	Louise	~~Robin~~	Alex	Richard	~~Richard~~	Bjorn	Tim
10th Fri	15	Robin	Louise	~~Robin~~	Jono	Alex	~~Richard~~	Bjorn	
11th Sat	15	Louise	Jamie		Jono	Alex			
12th Sun	15	Louise	Jamie		Richard	Jono			Dan
13th Mon	16	Jamie	Robin	~~Robin~~	Richard	Jono	~~Richard~~	Bjorn	Dan
14th Tue	16	Jamie	Bjorn	Robin	Tim	Richard	~~Richard~~		Dan
15th Wed	16	Bjorn	Louise	Robin	Tim	Richard	~~Richard~~		Dan
16th Thu	16	Bjorn	Louise	Robin	Alex	Tim	~~Richard~~		
17th Fri	16	Louise	Jamie	Robin	Alex	Tim	~~Richard~~		
18th Sat	16	Louise	Jamie		Richard	Alex			Jono
19th Sun	16	Jamie	Bjorn		Richard	Alex			Jono
20st Mon	17	Jamie	Bjorn	Robin	Dan	Richard	~~Richard~~		Jono
21st Tue	17	Robin	Louise	~~Robin~~	Dan	Richard	~~Richard~~	Bjorn	Jono
22nd Wed	17	Robin	Louise	~~Robin~~	Tim	Dan	~~Richard~~	Bjorn	
23rd Thu	17	Louise	Jamie	Robin	Tim	Dan	~~Richard~~		
24th Fri	17	Louise	Jamie	~~Robin~~	Alex	Tim	~~Richard~~		Richard
25th Sat	17	Jamie	Bjorn		Alex	Tim			
26th Sun	17	Jamie	Bjorn		Jono	Alex			
27th Mon	18	Bjorn	Robin	~~Robin~~	Jono	Alex	~~Richard~~	Louise	Richard
28th Tue	18	Bjorn	Robin	~~Robin~~	Dan	Jono	~~Richard~~	Louise	Richard
29th Wed	18	Robin	Jamie	~~Robin~~	Dan	Jono	~~Richard~~	Louise	Richard
30th Thu	18	Robin	Jamie	~~Robin~~	Tim	Dan	~~Richard~~	Louise	Richard

Other Possible Staff Structures

4 on 4 off pattern

2 days, 2 nights, followed by 4 off.

12 hour shift   0700 – 1900. Days
                 1900 – 0700. Nights

8 man staffing, shift = 42 hr, 12 hour shift, 1.5 hour breaks, staggered breaks, no further cover required.

6 on 4 off pattern

2 mornings, 2 afternoons, 2 nights followed by 4 off.

8 hour shifts   0600-1400
                 1400-2200
                 2200-0600

10 man staffing

1.	m	m	a	a	n	n	-
2.	-	-	-	m	m	a	a
3.	n	n	-	-	-	-	m
4.	m	a	a	n	n	-	-
5.	-	-	m	m	a	a	n
6.	n	-	-	-	-	m	m
7.	a	a	n	n	-	-	-
8.	-	m	m	a	a	n	n
9.	-	-	-	-	m	m	a
10.	a	n	n	-	-	-	-

12. Additional Benefit

In addition to the VTS role, radar coverage of the Little Russel would prove invaluable in search and rescue incidents within the Little Russel, allowing quick identification and location of vessels requiring assistance, particularly at night or in restricted visibility, and providing an accurate indication of a disabled vessel adrift.

References:

MGN 238, 239, 240
IMO Res. A.857(20)
SOLAS V – Reg 12
IALA Guideline 1111
IALA V103
MAIB Report 018/2015
Risk Assessment for Marine Oil Pollution in Channel Islands Waters