Solent Protection Society

Potential Pollution Problems in the Solent

The following paper has been produced to inform the members of the Solent Protection Society of the many and various types of pollution, the possible activities that can give rise to pollution, and where such activities are located in the Solent area. It then considers related matters such as the responsibility of various statutory authorities and actions that might be taken.

A paper by John Webb entitled "Thoughts on Solent Pollution" will be published in full on the Solent Protection Society website. This shortened version has been produced by members of the Council and we are grateful to John for his permission to use much of his paper.

Introduction

This paper considers three basic questions:

A What is pollution?
B What are the potential sources of pollution in the Solent?
C Where are the potential Solent locations for generating pollution?

The paper continues by considering matters arising from potential pollution:

D Responsibility for controlling and preventing possible pollution incidents
E Dealing with incidents
F Some General Conclusions

A What is Pollution ?

The first point to be considered is 'what is pollution?' Pollution can arise from various sources and includes the following:

Air pollution which could be particulates or gases;
Land pollution which could result in damage to the shoreline, intertidal zone, seabed or water;
Water pollution, toxic or not;
Light pollution;
Noise pollution;
Visual pollution, spoiling the view of the coast from the sea.

B Potential sources of Pollution

Pollution can originate from very many sources as diverse as aircraft engine exhaust to rubbish thrown from a ship. We must be concerned at the large number of systems in use which will be controlled by some form of computer. They may be inadequately implemented, inadequately certified and inadequately maintained, thus leading to the possibility of an accident. A simple example is marina lock systems such as Hythe, Port Solent and Chichester marinas. There may be considerable dependence on sensors being properly maintained, particularly as error handling can be poor. Ideally such systems would have a secondary checking system with override capability.

The following list of pollution sources can be considered:

(i) Oil pollution. This could vary from limited leaks from pipelines discharging direct into the sea, similar leaks entering the sea via waterways to major accidents such as the Sea Empress, an accident initiated by a wish to enter Milford Haven at the wrong time and exacerbated by, amongst other things, management failures and conflict between the local Council and the Harbour Master.

(ii) LPG leaks. These can be regarded as a variant of oil pollution. However, an LPG cloud is obviously extremely dangerous

iii) LNG leaks. LNG is potentially even more dangerous as the manner in which it is stored gives scope for rapid releases of energy. Fortunately the UK installations so far are nowhere near the Solent being in Milford Haven, Canvey, Isle of Grain and Middlesbrough.

iv) Collisions and groundings. These can cause any form of pollution as a consequence of the leakage of oil, LPG or other chemicals.
VLCCs entering Southampton have to have large tugs attached to provide a means of control in the event of power or steering failure. Smaller tankers do not have such protection. Container ships also don't have such protection. Container ships carry their bunker fuel in side tanks in the double hull with the bottom space being filled with ballast water so grounding should not have very severe consequences if they remain upright.

v) Nuclear pollution. This could be major such as a radiation leak from a nuclear submarine or minor such as permitted discharges. There have been several radiation leaks from nuclear submarines in the last few years, . It should also be noted that Rechem at Fawley have a licence to burn low level radioactive waste. In addition, the raw material for the manufacture of fuel rods is imported by container through Southampton which could cause chemical contamination.

vi) **Toxic chemicals** (what is toxic depends on what is polluted). The most well known incident is the 1984 Bhopal disaster which killed more than 3000 people. Are we fully aware of the chemicals being handled at the Fawley complex and possible reactions?

vii) **Water Pollution in General** is covered in some detail in a document published by the Environment Agency and Natural England.

viii) **Sewage** from sewage farms and storm releases, in particular combined sewer overflows. There are currently many Combined Sewer Overflows (CSO) licensed to spill into the Solent and Southampton Water and it seems that **as they are licensed they do not count as pollution** despite the effect being most undesirable. In addition, there are problems in Portsmouth Harbour where there is a strong correlation between the water quality and rainfall. There is a suggestion that some houses are connected to the storm drains but it is certainly related to CSO discharges.

ix) **Agricultural and other runoff**. There is a problem with nutrient enrichment plus other sources such as historic deposits of Tributyltin. There are also areas of organic enrichment on the western shore of Southampton Water. There are some old refuse disposal sites which could seep contaminated water.

x) **General rubbish** can arise from anywhere, thrown overboard or deposited on beaches.

xi) **Spills from marinas** with inadequate interceptors although they all appear to be suitably equipped.

xii) **Waterway blockages** such as a navigable channel blocked by a ship running aground or collision. It has not happened yet in the Solent but the QE2 grounding and subsequent tug activity may have come close.

xiii) **Ship tank washings** etc. are meant to be handled ashore in dedicated treatment plants. One can hope that no ship crew would fail to use the proper facilities provided within the Solent.

xiv) **Ship ballast water dumping.** As with tank washings one should be able to assume correct procedures are followed, particularly within the Solent.

xv) **Ship discharge of grey and black water**. It would appear there are problems with the consequences of discharging waste containing salt water into shore sewage handling facilities.

xvi) **Noxious smells**. Plenty of these affect anyone living near Fawley, sometimes the plume can be smelt as far away as the M271.

xvii) Dangerous gases. One assumes there are processes in place at the Fawley plants which discharge gases such as Sulphur Dioxide and can discharge other dangerous gases in the event of an accident. Fires elsewhere anywhere in the dock areas could also cause problems. There are also emissions from ships engines. It is of note that licences are issued for Fawley emissions which presumably ensure the aggregate is safe. However, MMO is responsible for controlling ship emissions and one wonders if the two collaborate.

xviii) Airborne particulates. The old problem with the grain silos at Southampton Docks should have been cured by a new dust extraction plant.

xix) Noise. There are not many noise sources and they are mainly confined to the Southampton Water area and parts of the New Forest under airport flight paths. There is also the noise from cruise ships entertainment. The Red Jet and hovercraft produce some noise but this does not last long.

xx) Light. The large conurbations are a source of considerable light pollution but there are still areas where one can see the night sky! .

xxi) Visual pollution. There are many instances of visual pollution

xxii) Fire from many sources. Fires are always a risk be it a pleasure boat catching fire and possibly sinking, a Forest fire spreading, or a fire on a large ship or port shore facility.

C Potential Solent locations for generating pollution

For a full list of locations please see the article on our website by John Webb "Thoughts on Solent Pollution".

D Responsibility for controlling and preventing possible pollution incidents

Numerous organisations have responsibility for policing these sites and activities, either with legal backing or as codes of practice.

Health and Safety Executive is a large body with many branches such as the Hazardous Installations Directorate covering different responsibilities. These includes procedures at all sites but the main topic of concern to us is the certification of process control systems with active elements, ie most of the Fawley plant, ship systems, waste disposal systems etc.

UKAS (United Kingdom Accreditation Service)

Environment Agency is responsible for very many things including hazardous waste controls. They state
Our principal aims are to protect and improve the environment, and to promote sustainable development. We play a central role in delivering the environmental priorities of central government and the Welsh Assembly Government through our functions and roles.

Marine Management Organisation is responsible for licensing, regulating and planning marine activities in the seas around England and Wales so that they are carried out in a sustainable way.

Natural England has many and diverse interests to fulfil its declared function as here:
Natural England is the government's advisor on the natural environment. We provide practical advice, grounded in science, on how best to safeguard England's natural wealth for the benefit of everyone.

Local Authorities.

New Forest Environmental Protection Liaison Committee has the following
FUNCTIONS AND TERMS OF REFERENCE
(a) To provide a forum for the discharge by the Council of its obligations under Section 35 of the Clean Air Act 1993 to consult with persons, organisations and businesses carrying on trade or business or appearing to the Authority to be conversant with problems of air pollution or having an interest in local amenity;
(b) To assist in the prevention of aerial and other pollution through the establishment and fostering of liaison between industry, control authorities, local councils and the public on environmental issues associated with the activities of industries (including strategic installations) within the area covered by the Committee;
(c) To assist the Council in the dissemination of information concerning aerial and related pollution issues.

British Standards Institution is responsible for developing and maintaining standards on very many topics for end enforcement by others.

Maritime and Coastguard Agency state their aims and purpose to be:
Our principal aims are to protect and improve the environment, and to promote sustainable development. We play a central role in delivering the environmental priorities of central government and the Welsh Assembly Government through our functions and roles.

Port Authorities. Mainly split between ABP who control Southampton and the eastern approaches to the Solent and Portsmouth QHM.

The Ministry of Defence DefStan organisation fulfils a similar role to BSI but in the military area

Defence Ordnance Safety Group
DOSG is the MOD's focal point for Ordnance, Munitions and Explosives (OME) Safety. DOSG provides policy, advice and regulatory functions on behalf of the Secretary of State and monitors departmental performance to provide assurance on OME safety to the Secretary of State through the Defence Ordnance Safety Board.

Defence Fuel Group is responsible for all aspects of fuel use in the MoD.

Defence Nuclear Safety Regulator is mainly concerned with the Nuclear Submarines.

UK Petroleum Industry Association.

Linewatch's aim *is to prevent incidents which could cause injury to persons, damage to the environment and damage to the pipeline system.*

DEFRA states its function as being:
to make policy and legislation, and work with others to deliver our policies in areas such as:
the natural environment, biodiversity, plants and animals
sustainable development and the green economy
food, farming and fisheries
animal health and welfare
environmental protection and pollution control
rural communities and issues.

National Chemical Emergency Centre.

International bodies and regulators such as MARPOL, IMO and EEC. It is difficult to find any reference to who is responsible for approving safety critical software based systems. Lloyds Register has an interest but there does not seem to be any information about what internationally agreed certification system exists. There are trade bodies but the increasing use of computer based control systems is a matter of concern.

Insurance Companies.
Insurance Companies have an interest in minimising their exposure.

E Dealing with incidents

Incidents can vary from a small oil spill in a marina to something as drastic as a fuel tanker colliding with a cruise ship or a major incident on a visiting US nuclear carrier or a submarine. In all cases, the basic requirements are similar and could be summarised as follows.

1) The incident has to be reported. This poses the question of who makes the report: it could be a member of the public dialling 101 or 999 or someone involved with the incident.

2) The receiver of the call has to decide who is responsible and ensure they are briefed.
3) The person nominated to handle the problem has to decide on a course of action. This should be by responding using a prepared plan.
4) In a simple case the problem will be dealt with easily. For example, a small fuel spill will be dealt with by dispersant and possibly booms. More complex cases will need a more elaborate response.
5) A more formal response requires the establishment of what is effectively a Command and Control (C&C) system. Again, plans should exist for this and they should be well rehearsed.
6) The C&C staff should establish what the threat is and activate pre-defined plans.
7) The decision might be made to upgrade the response to a higher level than was originally decided. This could involve transferring control to a larger scale C&C responder.

F Some General Conclusions

There seems to be a continuing lack of understanding of the need to properly document complex systems and to train users in their operation.

There appear to be lower standards in maritime design, implementation and operations than in aviation. This point is exemplified in the MAIB report on the grounding of the Hoegh Osaka. It is made clear that basic required checks and actions were not carried out, defective equipment was not repaired and measures to minimise the impact were inadequate. Information which should have been available was not passed on from above. When the accident happened it was said that quick thinking and skill caused the Bramble Bank beaching. In fact, it turns out that this was untrue, the heavy list to Port meant that the rudders were out of the water and so control was lost and chance caused her to end up on the Bramble Bank rather than causing a major channel blockage. The report indicated the problems were widespread in the car carrier trade but one should note the many other cases of inadequate standards throughout the maritime industry.

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