



PROMOTING EFFECTIVE
SPILL RESPONSE

OCEAN ORBIT

October 2022



Shoreline clean-up, Peru

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“Standing still is not an option for any organisation, and we are constantly seeking to challenge ourselves to be better and ready for new ventures and challenges ahead.”

Oli Beavon, ITOPF's Managing Director

Managing Director's review

Welcome to the latest issue of our newsletter *Ocean Orbit*, where I'm delighted to share news of our recent activities and developments.

This is the first issue of *Ocean Orbit* since I took over as Managing Director in January. I am only the eighth MD in ITOPF's remarkable 54-year history and am conscious of the excellent reputation the organisation has built up at the forefront of spill response worldwide.

In many respects, it's business as usual – we remain committed to our core technical services and are ready to respond to spills 24/7 just as we've always done. But standing still is not an option for any organisation, and we are constantly seeking to challenge ourselves to be better and ready for new ventures and challenges ahead.

My appointment last year coincided with our re-emergence from Covid-related restrictions and months of meeting virtually. We have since wasted no time on re-engaging face-to-face with our stakeholders and broadening our international connections. Though funded by the shipping industry, we have always recognised the need to build good relations with governments worldwide, and our recent activities in this area are

discussed on page 8.

ITOPF cut its teeth on oil spills, but we are available to respond to any cargo and any fuel that finds its way into our oceans and onto our shores. A selection of recent cases we've attended are presented on pages 3-7. Nurdle pollution, in particular, is currently a hot topic for both governments and industry, and on page 12 we share our experiences of the challenges involved in cleaning up these tiny pieces of plastic which can contaminate vast stretches of coastline from a single source.

As the shipping industry plays its part in cutting greenhouse gas emissions and striving for a more sustainable landscape, we'll also look at some of the alternative fuels proposed to replace fossil fuels for ship propulsion in the future and the implications these may have for the spill response community.

Looking ahead and finding innovative solutions to spill-related issues is an important aspect of our work. On page 17, we report on recent developments to improve environmental monitoring and mapping following a spill, and highlight our Flight VR training app which offers a new level of immersion and realism to learning the basics of aerial surveillance.

Finally, I'd like to acknowledge the role played by our hard-working team, who are central to all of the activities outlined in the following pages. As with many organisations, Covid provided an opportunity to reset our day-to-day working life and we have since introduced a hybrid blend of in-office and home working. As a team, we have formalised a set of company values to demonstrate what ITOPF stands for and, together, are fostering a company culture of personal growth and development, openness and respect. It just remains for me to welcome our new joiners, congratulate those who've received a promotion, and thank my predecessor, Dr Karen Purnell, for her time and generosity in showing me the ropes and distilling her extensive 30-year knowledge of the organisation in a few short weeks.

I hope you enjoy reading this issue of *Ocean Orbit*. We would love to hear your feedback or ideas for future articles.

Read Oli's interview on page 14 to find out more about his first months at ITOPF and his plans for the future.

COLLABORATION – INTEGRITY – OBJECTIVITY – RESPECT – DILIGENCE

SPILLS – ANY FUEL ANY CARGO



ITOPF has attended eight new incidents since the last issue of *Ocean Orbit* in February 2021¹. Two cases particularly stood out in terms of scale and workload, the Peruvian crude oil spill and the Sri Lankan nurdle case. A summary of these incidents, plus a selection of others are presented below.

Remote advice from the office has been provided for a further 60 cases. These involved a range of cargoes and fuels, including coal, granite dust, contaminated water, rapeseed oil, crude, and traditional and low sulphur fuel oils.

Nurdle spill, Sri Lanka

Incident date: 20th May 2021
Location: Colombo, Sri Lanka
Vessel: Container ship
Pollutant: Nurdles, assorted container contents, VLSFO, MGO

Nature of incident: A container ship suffered a catastrophic fire whilst at Colombo anchorage, approximately 10km offshore. All crew were successfully evacuated, and the vessel eventually sank. During the course of the fire, an unknown number of containers were lost overboard. Burnt debris and assorted container contents, including nurdles, quickly arrived in bulk on shore. Most of the heavy fuel oil on board was consumed by the fire, although a sheen of oil emanated from the wreck for several months.

In this case, the nurdles were the pollutant of particular concern as they have the potential to spread over vast distances and recovery of these small plastic pellets can be difficult and protracted (see our feature article on page 12). The nurdles initially stranded over approximately 30km of shoreline, eventually spreading up to 300km as they were remobilised with tides and rough weather.

Shoreline clean-up operations were organised by the Sri Lankan Marine

Environmental Protection Authority (MEPA), together with the Sri Lankan army and navy, with up to a thousand personnel on-site at the height of operations. A UK contractor was also appointed by the insurer to assist the authorities with the response effort. Clean-up primarily comprised a mixture of mechanical and manual collection of the burnt debris and plastics. As at

September 2022, clean-up operations remain ongoing.

ITOPF involvement: ITOPF has been deeply involved in several technical aspects of this incident since the outset. Following the initial fire, remote advice was provided to MEPA on potential risks and impacts from the chemicals, dangerous goods and oil on board to



Manual collection of nurdles, Sri Lanka. Inset: a handful of nurdles

¹ As at August 2022



ITOPF in discussions with MEPA on-site in Sri Lanka

the local environment and community.

Following the deterioration of the vessel and spillage of container contents, ITOPF was mobilised to site where we remained – with a team on rotation - for almost 12 months, providing technical advice to all stakeholders and helping to coordinate and synergise clean-up efforts.

We also trained a local NGO to provide surveying services to report on clean-up activities and the level of contamination; provided advice in relation to claims for clean-up and fisheries losses; implemented independent damage assessments; and advised on the appointment of other experts for environmental damage assessment.

Cargo vessel sinking, Greece

Incident date: 28th August 2021

Location: Coast of southern Greece

Vessel: Bulk carrier

Pollutant: VLSFO

Nature of incident: A general cargo vessel, carrying 7,000 tonnes of wheat, reportedly sank after it struck rocks in the remote, uninhabited Karavia islets of the Myrtoan Sea. It also had VLSFO, MGO and lube oil on board. In the days following the incident, oil was released continuously in limited quantities and observed as droplets that dissipated after reaching the water surface. The oil releases became more sporadic forming a non-recoverable sheen in the vicinity of the

sinking location. It was understood that no oil reached the shore. The wreck was located using a multibeam echosounder and following an underwater survey on 15th September which showed no active leaks of oil, clean-up assets and monitoring vessels were demobilised.

ITOPF involvement: ITOPF initially provided remote advice from the office

before mobilising to site. Our previous experience in Greece and knowledge of the key players enabled us to play an effective role during meetings with the local authorities and contractors on the reasonableness of the response operation. We also used satellite imagery to assess the frequency and extent of contamination and were involved in the assessment of clean-up claims.



Offshore recovery vessel, Greece



Aerial view of response efforts, Peru

Crude oil spill, Peru

Incident date: 15th January 2022

Location: Port of El Callao, Peru

Vessel: Tanker

Pollutant: Crude oil

Nature of incident: A spill of crude oil occurred during cargo discharge operations at an offshore terminal serving La Pampilla refinery near the Port of El Callao. This resulted in contamination of approximately 50 km of shorelines consisting mainly of sandy

beaches and rocky shore. The cause of the spill remains under investigation. The facility owners, supported by external contractors, led clean-up operations, with activities monitored and overseen by the Peruvian authorities. The incident involved a large-scale response both off- and on-shore. A variety of mechanical and manual techniques were used on the shoreline, depending on the particular substrate and level of contamination. These included the use of heavy machinery, surf washing, flushing, pressure washing and wiping by hand. The inaccessibility of some stretches of high-energy shoreline also

made natural attenuation a key player in clean-up.

ITOPF involvement: ITOPF was the first international organisation to arrive on-site in Peru and remained in country for over three months. We helped shape clean-up strategies by serving as technical advisers for the Peruvian Navy which allowed us to input our technical advice on a daily basis. ITOPF was also a member of the Technical Advisory Committee (TAC) a platform for intra-governmental and inter-organisational communication, problem-solving and decision-making established by the Navy.



Offshore operations, Peru



ITOPF providing advice on shoreline clean-up, Peru



Manual clean-up of sandy shore, Peru (see previous page)

Car carrier sinking, Azores

Incident date: 16th February 2022 (fire started) 1st March (vessel sank)

Location: South of Faial Island, Azores

Vessel: Vehicle carrier

Pollutant: VLSFO

Nature of incident: A fire broke out within the cargo hold of a vehicle carrier which ran adrift before developing a list and subsequently sinking at a depth of approximately 3400m. All crew were successfully rescued. Sheen was observed around the sinking position and, later, satellite imagery revealed a large slick initially traveling northwards. The slick was observed

to be dissipating naturally, with only a few patches of emulsified oil remaining on the sea surface for a longer period. Aerial surveillance conducted by ITOPF documented the disaggregation of the emulsified patches. A Portuguese navy patrol vessel and salvor's tug were stationed at the sinking site to monitor any further releases of oil, but only sheen was observed. The vessels were stood down and monitoring continued using aerial surveillance and satellite imagery, which confirmed the vessels' findings.



Aerial surveillance, Azores

ITOPF involvement: Whilst the vessel was on fire and adrift, ITOPF provided advice remotely in the form of a risk assessment and oil spill trajectory and fate modelling outputs. Following the vessel's deterioration and sinking, we were mobilised to site arriving on Faial Island, Azores on 2nd March. During meetings with the authorities, contractors, shipowner's representatives and insurer, we provided information and advice on the characteristics of the oil, its expected fate and behaviour when spilled, and the progress of the response operation generally. We proposed, organised and led the aerial surveillance operation, which was jointly conducted with the authorities, and organised the acquisition of satellite imagery to monitor the spill and ongoing emanations from the wreck.

Bunkering operation incident, Sweden

Incident date: 13th April 2022
Location: Anchorage off Gothenburg Port, Sweden
Vessel: Product tanker
Pollutant: VLSFO

Nature of incident: A small spill of VLSFO occurred following a bunkering incident off Gothenburg Port. Low level oiling was observed along stretches of the Swedish and Norwegian coastlines, with some oil stranding up to 215km north of the incident location. Shoreline clean-up operations near the incident location in Sweden were conducted by a private contractor and took approximately two weeks. In Norway, some manual clean-up was undertaken in a national park and involved municipal assets.

ITOPF involvement: ITOPF initially provided remote advice from the office, including trajectory modelling. Given an initial lack of information on oil strandings and the potential impacts from the incident, ITOPF was requested to mobilise to site and arrived on 2nd May. Building on pre-existing relationships with the authorities, ITOPF established good lines of communication with the stakeholders involved, prioritising an understanding of the characteristics, degree, and extent of oiling on the coastline, and consolidating information received by the insurer regarding reported oil strandings.

Cargo loading incident, Saudi Arabia

Incident date: 28th – 31st July 2022
Location: Ras Al Khafji Port, Kingdom of Saudi Arabia
Vessel: Crude oil tanker
Pollutant: Currently unknown

Nature of incident: An unknown quantity of oil was lost during separate incidents whilst a tanker was loading at single buoy moorings (SBM) at Ras Al Khafji Port. The



Manual collection of oil, Sweden

exact cause of these incidents is under investigation. Low level contamination – comprising primarily weathered tarballs – was observed by ITOPF on Kuwaiti shorelines. It is understood that some clean-up operations were undertaken by a Kuwaiti contractor for approximately five days. We do not have information relating to any operations in Saudi Arabia.

ITOPF involvement: Following initial remote advice, including trajectory

modelling, ITOPF was mobilised to site by the vessel's insurer to investigate potential impacts from the incident. ITOPF established lines of communication and developed a relationship with the stakeholders involved primarily through Marine Emergency Mutual Aid Centre (MEMAC). ITOPF also prioritised the understanding of the characteristics, degree, and extent of oiling on the coastline, and consolidated information received on reported oil strandings.



Shoreline survey, Kuwait



To report a spill, please call us on the numbers below for advice and/or to mobilise us to site.

UK office hours: +44 207 566 6999
After hours: +44 (0)20 7566 6998

Please do not rely on notification of emergencies to ITOPF by e-mail.





Working in partnerships with governments worldwide

IMO headquarters, London (photo courtesy of IMO)

ITOPF is the world's largest shipowner organisation. Together, our Members and Associates are responsible for over 90% of the world's ocean-going tonnage. As part of our services to shipowners, we have long recognised the need to build and nurture good relationships with government authorities in order to achieve our ambition of promoting effective spill response worldwide.

Governments – often through IMO – play a crucial role in providing a framework for pollution preparedness, response and compensation, and have a role in organising and overseeing clean-up operations.

With our unique role and position at the heart of ship-source spill response for over half a century, we have invested considerable resources in engaging with government agencies around the world to provide training and to support them with exercises, contingency planning and other advisory assignments. This work maintains our profile and reputation and enables the transmission of key messages outside of spills, during the preparedness rather than response stage.

Access to key government stakeholders before an event increases our influence when crucial decisions are being made during a spill response.

Some projects are driven by circumstances, but in many cases ITOPF actively seeks opportunities to

undertake assignments with particular governments. Korea has long been a focus area for ITOPF, for example, as it has suffered from a relatively high incidence of oil spills (we have attended over 60 incidents here since 1980) and, with its extensive fisheries and aquaculture sector, is highly vulnerable to the effects of oil contamination. In December 2021, we conducted a three-day interactive training workshop with the Korea Coast Guard (KCG), covering key aspects of oil and HNS spill response and incorporating a full day tabletop exercise and ITOPF's new Flight VR aerial surveillance experience. The

expectation is that these workshops will become annual events, in order to train a greater number of officers in pollution issues more quickly.

We also regularly work with governments through IMO and their regional affiliates. In November 2021, for example, we assisted REMPEC with the initiation of a national assessment of the level of oil spill response planning and readiness management for the central and eastern Mediterranean. This involved a series of online workshops at which participating countries were given the opportunity to carry out an informal draft assessment of their



Training with the Korea Coast Guard, December 2021

national contingency programmes using RETOS™, Arpel's Readiness Evaluation Tool for Oil Spills.

Earlier this year we provided in-country assistance to the São Tomé e Príncipe national authorities, through the GI WACAF programme (the Global Initiative for West, Central and Southern Africa) at a workshop to develop their national contingency plan. This involved helping them to define a national incident management structure for spill response; allocate key roles and responsibilities at national level; and to consolidate a document detailing the plan.

In the case of Singapore, our relationship with the government has been formalised with a Memorandum of Understanding. In 2020 ITOPF and the Maritime and Port Authority of Singapore (MPA) renewed an MoU on oil spill response equipment and vessel rates. This was first signed in 2007 to expedite claims for compensation, and signals the enduring success of this initiative – and our partnership – in facilitating compensation payments for the benefit of all parties involved.

As a consequence of our 'peace-time' activities, government agencies sometimes notify us directly when an incident occurs in-country. For example, in 2019 IBAMA (the Brazilian Institute of Environment and Renewable Natural Resources) approached us for advice following the arrival of large quantities of oil from an unknown source on the shores of the north-eastern region of Brazil. In total, our team spent over 100 days on site, helping to determine the scope and severity of the pollution and advising on clean-up techniques. Similarly, in 2021, we collaborated with



ITOPF on site with IBAMA, Brazil

the Israel Nature and Parks Authority to provide advice remotely on shoreline clean-up measures when large volumes of oil began washing ashore along approximately 160 km of Israel's Mediterranean coast. ITOPF staff usually attend incidents at the request of a ship's insurer or the IOPC Funds. However, where the team's technical experience and objectivity would be highly beneficial to response efforts, shipowners and their insurers fully support our involvement in unattributable incidents for the 'greater good', without the need to seek reimbursement of costs.

Through IMO, we have also been contributing to international efforts aimed at preventing an oil spill from the deteriorating floating storage and offloading unit FSO SAFER, which is moored off the coast of Yemen. This has included undertaking drift modelling to provide information on the likely spread of oil should there be a major oil release and to identify those countries and stretches of shoreline at risk. We have also shared our advice on how an effective response might be mounted in a such a challenging environment. The UN have recently announced that they are coordinating a donor-funded plan to resolve the situation.

Even for our more routine call-outs via a P&I insurer, our aim is to integrate ourselves within the command centre as quickly as possible. In the recent incident in Peru (described on page 5), for example, we enjoyed particularly effective relations with the authorities, serving as technical advisers to the Navy.

Going forward, we will continue building and sustaining long-term and trusting relationships with governments. Close cooperation with government agencies - and all other stakeholders - helps to ensure that clean-up is as effective and efficient as possible, and that damage is minimised. Our recently formed in-house functional groups on Contingency Planning and Advisory Work and Training and Education will allow for a more targeted approach to this work.



Working with the authorities in Peru



Is greener cleaner?

Spill implications from alternative marine fuels

Recent regulations from IMO and growing pressures from governments, organisations and the public is seeing the shipping industry undergo a 'green revolution' and explore alternative fuels for ship propulsion.

Traditionally reliant on heavy fuel oil, the sector has set targets for decarbonisation and switching to 'cleaner' low and zero-carbon bunker fuels, such as biofuels, LNG, ammonia and hydrogen which would produce fewer greenhouse gasses and pollutants.

The transition won't happen overnight, but alternative fuels are predicted to play a major role in the shipping industry in the future. According to DNV's *Maritime Forecast 2050 (2021)*¹, approximately 12% of current newbuilds have alternative fuel systems in place, with biofuels and LNG presently the most readily accessible alternative fuel source.

As the new fuels gain a foothold, we consider some of the implications for the spill response community ...

Environmental impact

Generally, alternative fuels are less persistent in the marine environment than conventional fuels and will therefore likely result in short- to medium-term ecological impacts.

Liquefied gases such as LNG, ammonia and hydrogen are understood to volatilize rapidly following release and will be lost to the surrounding atmosphere. Ecological impacts, although short-lived, are likely to include mass marine organism fatalities due to cryogenic damage, fire and explosion, fluctuations in local water column temperature and pH, as well as potential seabird fatalities from vapour cloud formation. These impacts are likely to be felt within the immediate vicinity of an incident.

Biofuels share similarities in terms of composition, fate and behaviour to traditional fuel oils. However, recent

studies have shown that these types of oil tend typically to be more readily biodegradable and therefore less persistent (depending on the blend ratio) compared with their conventional counterparts.

Risk to human health

There is a significantly greater risk to human health with incidents involving alternative fuels compared with traditional fuel oils. An explosion of ammonium nitrate in the Port of Beirut in August 2020, for example, resulted in the deaths of 220 people and severe damage to nearby residential and commercial areas. Although this incident was not shipping-related, it serves to highlight the potentially disastrous consequences of an accident on-board an ammonia-fuelled vessel. As well as fire and explosion risks, there are also significant risks of asphyxiation resulting from formations of

vapour clouds and cryogenic risks from liquefied gaseous fuels.

Alongside these worst-case scenarios, it is important to note the work being undertaken by engine manufacturers, ship designers and regulatory bodies in reducing the risks of these incidents occurring. However, experience shows that there is still potential for systems to fail, and responders should be prepared in that eventuality.

Implications for spill response

Biofuels typically behave in a similar way to conventional fuels when spilt in the marine environment and traditional oil spill response techniques would still be appropriate. Some biofuels, for instance certain vegetable oils, also solidify following release into the marine environment and therefore more rudimentary techniques may be effective, such as collection with fishing nets.

For liquefied gaseous fuels such as LNG, ammonia and hydrogen with potential flammability risks, containment of this type of fuel would be hazardous to human health as well as ineffective. As it is likely that any substance released would volatilize rapidly into the atmosphere, the standard clean-up techniques would not be necessary. More resources may be focused on mitigating human health risks, modelling and evaluating potential vapour clouds and flammability limits, and using water suppression systems to divert any vapours drifting towards

¹ *Maritime Forecast to 2050* | DNV

populated areas or areas of ecological sensitivity. However more research and development is required in order to understand fully how these substances will behave once released.

Liability & compensation gap

Spills of these alternative fuels are not currently covered under any of the international liability and compensation conventions established under the auspices of IMO.

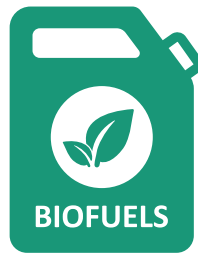
ITOPF work in this area

In order to support our Members, Associates and their P&I insurers with up-to-date, high-quality technical advice, we have established an internal working group to keep abreast of any developments in this area.

We also appreciate the importance of industry collaboration and knowledge-sharing especially in a newly emerging landscape where innovations in technology are occurring daily. As such, we are a member of Standard Club's Alternative Fuel Advisory Panel (SAFAP), which aims to exchange pertinent information relating to industry developments, regulatory framework implications and potential drivers and barriers to new marine fuel types. This advisory panel includes key professionals from shipping associations, industry consultants, engine manufacturers, classification societies, maritime lawyers, ship managers and bunker operators. We are also part of the IPECA alternative fuels and alternative energy working group, comprising primarily oil company representatives.

For more information on alternative fuels, please contact Andrew Le Masurier, Technical Adviser (andrewlemasurier@itopf.org).

ALTERNATIVE VS TRADITIONAL – IMPLICATIONS FOR SPILL RESPONDERS



Typically, less persistent in the marine environment, short-medium term damage	Significantly less persistent in the marine environment, short-medium term damage	More persistent in the marine environment– potential for longer-term damage
Potential for mass localised marine organism & seabird fatalities	Potential for mass localised marine organism & seabird fatalities in immediate incident vicinity	Potential for wildlife oiling, may lead to fatalities over a wide area
Human health impacts expected to be minimal, though may be experienced on an individual level	Potential for fatalities on a large-scale and significant damage to infrastructure from explosion risk	Human health impacts minimal, though may be experienced on an individual level
Traditional clean-up techniques suitable, ie containment & recovery. Rudimentary techniques for solidified oil, ie fishing nets	Response focused on monitoring, evaluation and evacuation of vessel/ neighbouring areas	Traditional clean-up techniques suitable, ie containment & recovery
Liability & compensation route undefined	Liability & compensation route undefined	Covered by international liability & compensation regime



Lumps of palm stearin afloat and washed ashore, Hong Kong

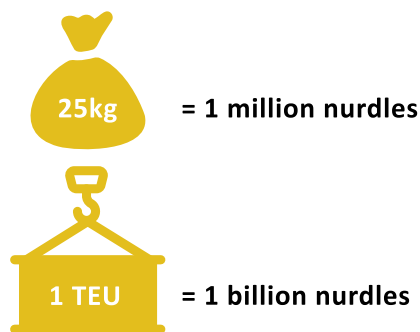


Nurdles – one container, a billion problems

Plastics have become an integral part of our daily lives. Highly versatile, lightweight, durable and affordable, our consumption of plastic has quadrupled over the past 30 years, and global plastics production has doubled from 2000 to 2019 to reach 460 million tonnes.¹ But our usage comes at a price – pollution from the improper disposal and accidental losses of plastics now constitutes a major global environmental issue.

Plastic debris – from both terrestrial and maritime sources – is found ubiquitously in the marine environment. The maritime industry's contribution is primarily linked to fishing activities, illicit waste disposal and the loss of containers during shipping incidents. It is with this latter source that ITOPF comes in...

On average, more than 1,600 containers are lost every year, according to data published by the World Shipping Council;² many of them carrying plastic items in various forms. On occasions, lost containers hold billions of small plastic pellets, also known as nurdles.



Sieving nurdles to separate them from the substrate, South Africa

Nurdles are the size of a lentil and used as raw material for almost all day-to-day plastic items. To provide context, it takes around 600-1000 nurdles³ to create one small plastic disposable water bottle, for example.

It is estimated that around 230,000 tonnes of nurdles are lost to the environment annually.⁴ Once in the marine environment, nurdles are dispersed by winds and currents, potentially resulting in widespread contamination of coastlines.

Within the last five years, ITOPF has responded to four significant spills of nurdles, varying in magnitude and scale,

including the largest nurdle spill known to date – the X-PRESS PEARL.

The quantities lost have ranged from 50 to 10,000 MT, while clean-up sites have included pristine remote locations along the Garden Route, South Africa, and chronically polluted shorelines in Sri Lanka. As a result of this involvement, ITOPF has first-hand experience of the challenges of recovering significant quantities of nurdles from marine and shoreline environments.

Highly mobile & spread widely

Due to their small size and buoyancy, nurdles are highly mobile and can spread over vast distances if released to sea. When washed on shore, they will readily mix with shoreline sediments and can become buried or trapped between rocks and within vegetation, potentially remobilising with tides or during rough weather at a later date.

Harmful to wildlife

The effects of nurdles on wildlife is primarily two-fold – physical and toxicological. If ingested, nurdles can remain lodged in an animal's stomach causing them to feel full, which may lead to starvation and ultimately death. Nurdles also attract and absorb toxic pollutants, such as DDT and PCBs which, if consumed by species such as seabirds, fish and crustaceans, can transfer up the food chain. More than 690 marine species are reported to ingest plastic⁵ and significant research is currently ongoing in this important area.



Nurdles washing ashore, Sri Lanka

Clean-up

Response options for nurdle spills are currently fairly rudimentary and clean-up operations tend to be labour-intensive and protracted. In most cases, at-sea response is not considered a viable option for loose nurdles. Once nurdles have landed onshore, manual recovery is often the most effective clean-up option as it is selective and reduces the amount of unpolluted material – such as sand and other organic debris – that is collected. This mainly involves the use of sieves and water separation techniques. Means of mechanical recovery of nurdles are limited and need to be developed further.

High concentrations of nurdles can be cleaned relatively easily, however removing all traces of contamination is difficult. The rate of recovery depends on a number of factors, including the location of the incident, background levels of plastic pollution, the accessibility of the contaminated shoreline, shoreline type, and, ultimately, the specific response endpoints established by the authorities and stakeholders. In the recent cases ITOPF has attended, between 40–70% of spilt nurdles have been recovered.

In all cases, a rapid response is essential (to minimise the opportunity for nurdles to remobilise or become buried by tidally transported sediments), combined with regular surveys and dynamic prioritisation of sites for clean-up. Early notification to authorities and response organisations is essential for source control and mitigation.

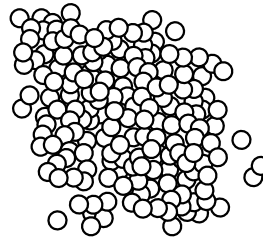
ITOPF work in this area

Given the way nurdles are currently transported and the likelihood of future container losses, nurdle spills are now a specific and deliberate element of ITOPF's pollution response armoury. To share our experiences and broaden our knowledge, ITOPF has become a member of two external plastic pollution working groups, led by the International Group of P&I Clubs and the United Kingdom and Ireland Spill Association respectively.

Following the 2022 IMO Pollution, Prevention and Response sub-committee meeting, we have also offered our assistance to the Norwegian Coastal Administration in developing a guideline on best practice when responding to spills of nurdles.

Further information on this topic is available in a paper by Samuel Durrance (samdurrance@itopf.org) presented at the 2022 Interspill Conference & Exhibition.⁶

HOW DO NURDLE SPILLS COMPARE TO OIL SPILLS?



FATE

- | | |
|---|---|
| <ul style="list-style-type: none"> • Bulk nurdles able to remobilise • Residual nurdles highly mobile and subject to met-ocean conditions • Seasonally buried and exposed • Makes clean-up and defining endpoints challenging | <ul style="list-style-type: none"> • Bulk oil able to remobilise • Once bulk oil removed, residual oil less likely to remobilise • Enables targeted cleaning and clear definition of endpoints |
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PERSISTENCE

- | | |
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| <ul style="list-style-type: none"> • Conventional plastics designed to last and don't easily biodegrade in the environment • May only disintegrate physically – via mechanical forces • Mass of plastic doesn't change, only its size distribution | <ul style="list-style-type: none"> • Depends on physical and chemical properties of hydrocarbon • Some oils less persistent than others • Naturally bio-degrades and naturally attenuates |
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IMPACTS ON WILDLIFE

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|---|--|
| <ul style="list-style-type: none"> • Impacts of nurdle spills not yet well understood, requires more research • Potential physical impacts – ingestion, may lead to false satiation and ultimately starvation • Potential toxic effects – ingestion of persistent organic pollutants, heavy metals, PAH which enter the food chain | <ul style="list-style-type: none"> • Impacts of oil spills generally well understood • Physical smothering, potentially affecting respiration, feeding & thermoregulation • Toxic effects, maybe lethal or sub-lethal |
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CLEAN-UP OPTIONS

- | | |
|---|--|
| <ul style="list-style-type: none"> • At-sea response not viable for loose nurdles • Shoreline clean-up primarily manual • Mechanical clean-up options limited but developing | <ul style="list-style-type: none"> • Containment & recovery at sea a viable option in many scenarios • Shoreline clean-up options well understood and involve a variety of manual and mechanical means |
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¹ Plastic pollution is growing relentlessly as waste management and recycling fall short, says OECD

² Containers_Lost_at_Sea_2022.pdf (squarespace.com)

³ <https://missionaransas.org/news/how-many-nurdles-does-it-take/> / <https://www.fauna-flora.org/nurdles/#:~:text=Nurdles%20are%20melted%20down%20and,in%20the%20ocean%20every%20year.>

⁴ <https://www.eunomia.co.uk/marine-plastics-we-should-fight-them-on-the-beaches/>

⁵ Estimating the size distribution of plastics ingested by animals | Nature Communications

⁶ <https://www.itopf.org/knowledge-resources/documents-guides/nurdles-one-container-a-billion-problems-2022/>



SPOTLIGHT

Oli Beavon - ITOPF's new MD



Our Communications Officer, Joe Lane, interviews Oli Beavon about his first months in the role of MD at ITOPF and what's coming up ahead. Watch the full interview on our website.

What first attracted you to the role of Managing Director at ITOPF?

Honestly, it was the previous MD Karen Purnell. She was somebody I knew previously from the industry, and I had a lot of respect and admiration for what she and ITOPF did. I had visited ITOPF in around 2015 in a previous role associated with the shipping industry. So, what attracted me to the role? It was Karen letting me know that she was moving on and that there was an opportunity and gosh, yes, I was interested straightaway.

How would you describe the first period of your tenure at ITOPF in three words?

Exciting I think is definitely the first word. Probably **enduring**. I'm really conscious of the fact that ITOPF has been around for 54 years, and I hope and expect that it'll be around for the same and longer, so enduring in terms of the next 100 years or so and the impact I can possibly have in a short amount of time. Also **provocative**, I think. By turning up as an external Managing Director, I can offer a perspective that's a little different to my predecessors, and I notice that does provoke some conversation and potentially some change, so I'm very conscious of that.

What are your short, middle, long term priorities as a Managing Director?

Initially, my first priority was to get to know people and to spend time internally with people. And in some ways, Covid allowed that because it forced us not to get out and about and visit people internationally. So short term, it

was always around people. I think we're already now in the medium term. So it's 'What strategically does ITOPF look like over the coming years?' And we've already looked at a Singapore office as an opportunity, which we'll talk about a little bit later. And then, long term it's how do we remain relevant. ITOPF has always provided objective technical advice. We have scientists who really know their stuff when it comes to spill response. But the world is changing. It's becoming more complex. We're having to spend longer on sites than previously because spills become more complex. So remaining relevant has a number of facets to it as well.

What other themes or challenges have you experienced since you've started working at ITOPF?

I guess an initial challenge was to get to know people. Covid prevented me from getting out and about initially, in some ways that was an opportunity to look internally, but now it's almost overwhelmingly come at once. I have been getting out and meeting stakeholders across a number of different areas, so I think that's been a really important opportunity actually to take and get to know our stakeholders better.

And those stakeholders include Members and Associates, but also the P&I Clubs. And also, I didn't know all of



Some hands-on training with the ITOPF team at Cedre

Membership Matters

In February, immediately after the end of the 2022 renewal season, the imposition of sanctions on Russia following the invasion of Ukraine meant that the Membership Team had to understand how this impacted ITOPF and how we could ensure that we did not breach the sanctions.

We needed to identify Russian-controlled vessels and Members, and to understand the scope of the sanctions. Our approach comprised: i) Identifying impacted vessels – we used the Seasearcher Risk and Compliance intelligence tool and raised any queries with the P&I insurers involved; ii) analysing the legal position – we worked closely with our lawyers to ensure that the implications of sanctions were fully understood; and iii) identifying the government department that would permit ITOPF to attend a spill from a sanctioned vessel under an environmental protection clause within the sanctions legislation. Events moved quickly and navigating through the rapidly evolving sanctions situation has been a complex and time-consuming challenge.

We have also increased our due diligence processes with regard to possible fraudulent ship registration. This adds an additional layer of complication to sanction checking and is an important way of ensuring that all of our Members are of 'good standing'.

We are continuously reviewing our Membership practices and processes to ensure that they remain fit-for-purpose, and run seamlessly and efficiently.

If you have any queries on Membership matters, please contact our Senior Membership Secretary, Karen Young at membership@itopf.org.



Karen Young, Senior Membership Secretary



Out and about at a meeting and workshop with North P&I

our board members when I joined. So, I've just spent the time to meet them virtually at first and now, wherever possible, in person as well.

What is the most common question that you've been asked as MD of ITOPF?

I was going to answer that tongue in cheek and say the most common question is, 'Who are you?' - but that's not strictly true... I get questions that range from those very informed about ITOPF and what we do around, 'Where are you going?', 'What's your strategy?', 'Where do you put your emphasis?'. But also, I do get the question of 'Tell me about ITOPF, who are you and what do you do?'

So, I get the whole spectrum of questions and it's great to have the opportunity to answer those because I think ITOPF has so much to offer. And we need to get out there and let people know how we can help.

What is it about your role that you like the most?

Gosh, I like the role and it's the variety I think that really appeals to me. So, it's thinking about a business, an organisation and how that works. It's thinking about the internal activity and the people associated with that. It's also looking for continuous improvement opportunities. So, around our technology, around our systems, opportunities to simplify, opportunities to change and upgrade, perhaps, what we do over time.

Then there's just getting out and understanding how we can add value. So, I'm excited by what ITOPF can give in terms of spill response, but also the broader environmental, social and governance agenda that I think we can contribute to.

Is there anything you'd like to expand on on the theme of ESG for ITOPF?

I think inherently by having a scientific body like ITOPF that understands the impact on the environment that spills cause, I think we can have a really good impact on environmental, social and governance issues in the marine sector. So, it's just really leveraging the enthusiasm, the inherent knowledge, the cognitive experience of ITOPF and helping our stakeholders – our Members, Associates and the P&I Clubs themselves.

And what's next for ITOPF?

In the short term, we've committed to open another branch office. ITOPF has always been London based with a single London office. So, it's quite a big deal to be opening a small branch office in Singapore. This came after a considerable amount of thinking at Board level, some strategic endorsement of looking at an Asia-Pacific presence and then internally as a team since around January, February of this year, looking seriously at that proposal. I'm excited that we'll probably have an office open by 1st December.

So, it's actually all come very quickly as Covid has allowed us to get out and make these things happen. So that's the immediate term, I think maintaining our capability has been really important. So, that means the vacancies that we had in the organisation – we did a little bit of insourcing. We had external providers providing a service and frankly, it wasn't really meeting all of our needs. So we said, you know what, we can bring some of those activities in-house and see if we can deliver value in that way. So, a number of things have been happening in ITOPF straight away.

Meet the Technical Support Team

Our spill response and training activities are the most visible aspects of our work, but, behind the scenes the wider team all have an important role to play in fulfilling the mission of ITOPF and supporting the company's core values. Here, Tim Wadsworth, Technical Support Manager, gives us an insight into the activities of his team – Technical Support.

A number of high-profile incidents in the late '80s and '90s, including AEGEAN SEA, HAVEN and SEA EMPRESS, generated significant claims work for ITOPF technical advisers as the Civil Liability and Fund Conventions became established and compensation limits increased. Compensation under these conventions is paid for reasonable losses, meaning a thorough investigation of submitted claims is required to advise the parties paying compensation on appropriate payments. ITOPF is ideally placed to provide this advice using observations made whilst on site during a response.

As a consequence of this increasing workload, the technical support function was developed to assist the wider technical team with the assessment of claims. Since the late '90s, Technical Support has assisted with the assessment of claims from many prominent incidents, including ERIKA, PRESTIGE, VOLGONEFT 139 and AGIA ZONI II, and numerous cases that despite their lower profile resulted in complicated claims. Where a significant claims workload can be anticipated following a pollution incident, the Technical Support Team is able to attend on site to observe and record information in preparation for the assessment process.

In former years, submitted clean-up claims were accompanied by boxes of supporting paperwork, including invoices, receipts, work orders, meeting reports, shoreline work reports, hire and charter agreements, aircraft and vessel logs etc etc. This documentation required significant time and effort to sort and check to confirm the claimed expenditure and activities aligned with the criteria of admissibility under the International Conventions. With advances in technology, such documentation is now submitted electronically and is often available on central databases to all the parties involved in the compensation process, streamlining the system to allow more rapid assessments to be made. Claims for clean-up are the primary focus of the work of the Technical Support Team, in particular advising on reasonable rates for the involvement



The Technical Support Team continue to work on claims arising from the AGIA ZONI II incident

of personnel, equipment and consumables and on reasonable activity. Nonetheless, the Technical Support Team has assisted with the assessment of claims for pollution damage, such as economic losses in the fisheries and tourism sectors and environmental damage. Training colleagues internally and our partners externally on the claims process and ITOPF's involvement in this important component of pollution response is a key aspect of the work.

While the assessment of claims remains an important element of the Technical Support Team, other aspects of the team's activities contribute to ITOPF's technical functions. As part of the wider internal Mapping, Modelling and Monitoring Working Group, the Technical Support Team is able to run computer trajectory and weathering models to anticipate the movement and behaviour of pollutants. Sourcing and interpreting satellite imagery is an increasingly important task as the availability of satellites improves and costs decrease. Technical Support assists further by following developments with pollution response techniques and equipment, building and maintaining relationships with manufacturers, response contractors and other service providers. Relationships with many of ITOPF's other stakeholders are also at the forefront of this work of Technical Support.



Tim Wadsworth, Technical Support Manager



Members of the Technical Support Team, Jamie Stovin-Bradford, Technical Support Coordinator, & Phil Ruck, Senior Technical Support Coordinator

ITOPF News

Flight VR

ITOPF launched its first Virtual Reality training app during London International Shipping Week in September 2021. Flight VR offers a new level of immersion and realism to learning the basics of aerial surveillance during spill response. It covers a number of fundamental concepts including aircraft selection, the observation of false positives and data capture.

The app has since been integrated into tailored desktop exercises for key stakeholders, including the Korea Coast Guard, P&I Clubs in the UK and Singapore, and students at the World Maritime University. For more information, please contact Miguel Patel, our Training & Education Functional Lead (miguelpatel@itopf.org).



The VR app was also a major draw at our exhibition stand at Interspill (photo courtesy of Interspill)



Shoreline survey app

To support our work on-site, ITOPF has been investigating software solutions to assist with environmental monitoring and mapping following a spill. This has culminated in the development of a shoreline survey data collection app.

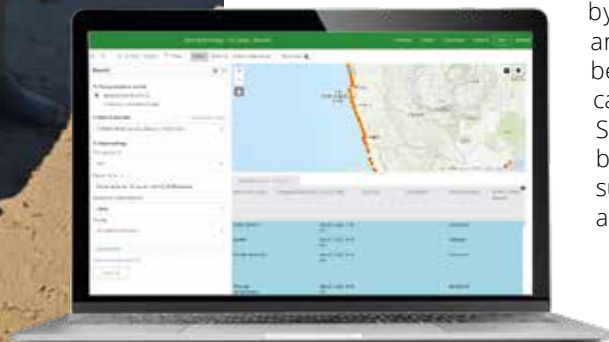
The app – built on an ESRI platform – captures detailed, standardised information and photographs on the scale of contamination along affected shorelines. Formatted, branded reports showing survey results can be automatically generated and shared with other stakeholders. A 'live' real-time incident operational dashboard can also be provided, where levels of contamination and on-going clean-up activities can be visualised and interrogated.

The app was successfully trialled and rolled out during the response to the X-PRESS PEARL incident in 2021, when 300 km of the Sri Lankan coastline was contaminated with nurdles to varying degrees. During the incident, ITOPF collaborated with OSRL who were also mobilised to assist with response efforts. Both organisations use ESRI and industry data formats, allowing data to be shared seamlessly within the platform to enhance response management.

Over 10,000 surveys have been completed to date by over 50 participants from five different organisations. A dashboard was made available to responders, government representatives and insurers, facilitating the transfer of information from site to stakeholders offsite and allowing informed operational decisions to be made.

The app was well received by the national authorities and insurers and has since been used on several other cases, both on-going and new. Several ESRI field apps have also been configured and used for surveys, including boat surveys, and for sharing information.

For further information, please contact our GIS specialist Naa Sackeyfio (naasackeyfio@itopf.org).



ITOPF Technical Advisers testing the survey collection app in Pembrokeshire

ITOPF's 2022 R&D Award funds project on low sulfur fuel oils

The 2022 ITOPF Research and Development (R&D) Award was granted in April to the Huntsman Marine Science Centre in Canada, in partnership with Bigelow Laboratory for Ocean Sciences, USA.

Their winning project - **Photomodification Of Low-sulfur-fuel-oils: Investigations of Toxic Effects (POLITE)** - seeks to understand the behaviour of spilled LSFOs and ULSFOs when exposed to sunlight, specifically in relation to their toxicity to marine organisms.

Special attention is being given to how these products may impact commercially important marine species such as Atlantic cod, American lobster and green sea-urchin.

Part of the samples used in this project will be provided through a partnership with the Australian Maritime Safety Authority (AMSA), which is also studying LSFOs and their fate and behaviour from a response perspective.

Findings from the two-year project will be published on our website as soon as they're available.



Hands-on training with Cedre

In July 2022, ITOPF travelled to Cedre's facilities in Brest, France for four days of practical activities and knowledge exchange. During a series of exercises and a mock pollution event, newer members of the team got their first experience of using response equipment, whilst older hands got a timely reminder of their safe and effective operation. Both organisations delivered presentations, sharing recent experiences and building good relations for the future. More members of the team went through the training in October.

Applications are now open for 2023 Award

Applications for the 2023 Award are open from 1st September – 2nd December 2022. This year, special consideration will be given to projects focusing on emerging fuels, HNS spills, plastic pollution from spills, mariculture and remote sensing (imagery and sampling/analysis).

Further information on how to apply is available on our website at <https://www.itopf.org/in-action/r-d-award/application-process/>. Potential candidates should not hesitate to contact us if they have any questions about the Award by emailing rdaward@itopf.org.



Photo courtesy of Interspill

ITOPF at Interspill

In June 2022, the ITOPF team joined colleagues from the spill response community for the Interspill 2022 conference & exhibition at the RAI Centre in Amsterdam. Our busy week began with a short course on oil spill fundamentals, and continued with the presentation of seven papers. We also

chaired several sessions and organised a lunchtime workshop on plastic pollution.

Our exhibition stand proved to be a hive of activity with many delegates trying their hand at our Flight VR app on aerial surveillance.



IOPC Funds visit

ITOPF was delighted to welcome the IOPC Funds to our office in September 2022 for lunch and an informal afternoon seminar. Both organisations presented on their respective roles, and we also shared experiences of recent on-site activities, as well as developments within information, communications and IT. This was an excellent opportunity to reacquaint ourselves with each other's work and reignite the social connections our organisations have long held.



Oil Spill India

In August 2022, ITOPF exhibited at Oil Spill India for the first time, to increase awareness of our role and activities in the region. Richard Johnson and David Campion presented papers at the event and Richard also acted as panellist and chair.



Staff summer social

For our annual summer social and team building event, ITOPF staff enjoyed some cake making in the 'bake-off' tent in July 2022.



Quad bike training

We have now introduced quad bike training for our technical team, to make sure they are appropriately prepared for any risks involved. Quad bikes are often used to access and travel along remote stretches of shoreline during pollution response and can make the work of staff on-site more efficient.



Lunch & Learn at London International Shipping Week

ITOPF held an Interactive Lunch & Learn event as part of London International Shipping Week in September 2021. After months of meeting virtually, this was a great opportunity to reconnect in person with our partners in the shipping world, raise awareness of our activities and latest developments, and, not least, have a most enjoyable afternoon!

Staff news

New joiners

We are delighted to welcome a number of new staff to our growing team.

In September 2021, **Rosalynd Wilson** joined as Office Administrator – Travel and Project Support, having spent the previous six years in the pharmaceutical events industry; **Jamie Stovin-Bradford** joined as Technical Support Coordinator, following the completion of an MSc in geophysical hazards from University College London; and **Oli Beavon** joined as MD – designate, taking over the reins as MD on 31st December following Karen Purnell's retirement. (Find out more about Oli in his interview on page 14.)

In December/January, we welcomed **Natalie Kirk** and **Amy Jewell** as Technical Advisers. Natalie has previous experience working as an oil spill responder, and Amy joined following the submission of her PhD in paleoclimate & geochemistry at Southampton University,

Also in January, we welcomed **Joe Lane** as Communications Officer. Joe brings several years' communications experience from the water industry to this new role, which includes digital communications management, creative content development and press duties.

In May, **Teresa Rideout** joined as a part-time Office Assistant, responsible for managing reception, visitor hospitality and providing wider administrative support. She has a creative background, and previously worked within the financial services industry.

Our most recent recruit, **Aaron McPherson**, joined as IT Support Technician in August. He was previously an IT Technician for a government department, and is now responsible for supporting the team with their day-to-day IT needs and maintaining and developing its information systems.

Promotions

In January, Technical Advisers **Phil Ruck** and **Dr Duarte Soares** were promoted to the position of Senior Technical Adviser. In August, Phil transferred into his current role of Senior Technical Support Coordinator, where his responsibilities include claims co-ordination and stakeholder engagement. In October, **Karen Young** was promoted to Senior Membership Secretary, **Jayne Foster** to Office Manager and **Jo Woodward** to Executive Assistant.



New joiners from left to right: Aaron McPherson, Natalie Kirk, Joe Lane, Amy Jewell, Rosalynd Wilson and Teresa Rideout. Inset: Jamie Stovin-Bradford

Dr Karen Purnell retires

Karen joined ITOPF in 1994 as its first female technical adviser and rose through the ranks to become MD in 2009.

During her career at ITOPF, she attended more than 30 spills, including landmark incidents such as the SEA EMPRESS (UK, 1996), PRESTIGE (Spain, 2002) and TASMAN SPIRIT (Pakistan, 2003). She also provided technical advice on contingency plans for government and industry, contributed to numerous training courses and advisory assignments, and was a speaker at major conferences and events worldwide. Prominent amongst her achievements was the expansion of ITOPF's capability to respond to spills of hazardous and noxious substances (HNS). She was also a keen supporter of STEM initiatives, aimed at encouraging young people to develop

an interest in science, technology, engineering and mathematics.

We thank Karen for her dedication and commitment to the organisation over nearly three decades and wish her every success and happiness for the future.



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PROMOTING EFFECTIVE
SPILL RESPONSE

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