

From the Editor

Happy New Year! GloBallast has been in action for ten short months and we enter 2001 forging ahead with a whole range of activities; bringing us closer to increased protection of the world's oceans from the threat of invasive species.

In this issue of Ballast Water News we report on many of these developments through 'Programme Highlights' (pages 2 and 3) and our summary 'Progress Report' (page 8). In addition, with the convening of the 45th meeting of IMO's Marine Environment Protection Committee (MEPC) last October, this issue takes a look at the development of the new international convention on ballast water.

In line with this theme, we are most pleased to welcome Mr Mike Julian, the Chairman of MEPC, as our guest speaker in this issue. It is now anticipated that the text of the new ballast water convention will be agreed by IMO member countries in 2002. This would enable a Diplomatic Conference to be held soon after. The signing of this convention will mark the biggest step yet taken to address one of the four greatest threats to our oceans. We will keep you updated.

An issue with potentially significant ramifications for the international legal instrument is the unilateral enactment of ballast water management regimes by individual jurisdictions. We update this issue on pages 6 and 7.

In addition to publishing Ballast Water News, we have continued to put significant efforts into further developing the other legs of our global communication and information clearinghouse functions. This has included the launching of our new web-site, <http://globallast.imo.org>; the continued expansion of the IMO library ballast water collection (which has grown by 270% since the programme commenced) and the creation and continuous updating of a ballast water treatment research and development directory.

Feedback from all stakeholders continues to be positive. We need more articles for future issues. If you would like to submit an article for consideration, please do so. Ballast Water News has a global distribution of more than 15,000, and is also posted on our web-site. It therefore provides a useful medium to get your message across. Happy reading!!



Steve Raaymakers
Contributing Editor

From the Programme

Two major meetings occurred during the October – December 2000 quarter, the 45th meeting of MEPC and the second meeting of our Global Project Task Force (GPTF), the highest advisory group to the GloBallast programme.

MEPC 45 gave added impetus to GloBallast in pursuing one of our main development objectives, assisting developing countries to prepare for the implementation of the new ballast water convention.

At the 2nd GPTF meeting, substantive approval was given for the draft National Workplans prepared by each of our six pilot countries. This represents a major milestone, and will allow activities to commence in each country in early 2001. The initial focus will be on communication and awareness raising, ballast water risk assessments and biological baseline surveys at each site. These will provide the foundation for ballast water management measures, including training, policy and legislative tools.

A pleasant surprise during this early phase of the programme has been the very high level of regional interest. The programme's Country Focal Point (CFP) for India, Mr Chakrabarty, briefed member countries of the South Asia Cooperative Environment Programme and reported significant interest. The CFP for South Africa, Dr Jackson, briefed West African countries at a meeting in Angola, and similarly reported a high level of interest. The Government of the Islamic Republic of Iran made contact with neighbouring countries and the development of a regional ballast water strategy for the Gulf is now firmly on the agenda. Brasil has initiated scientific contacts with Argentina to combat the invading mussel *Limnoperna fortunei* and Ukraine has written to all Black Sea states seeking cooperation.

Further links have been established by the PCU with other global organisations, including the World Health Organization, the World Maritime University and the UN Train-Sea-Coast programme. Relations with the international shipping and port industries and environmental NGOs have moved from strength to strength. I would like to take this opportunity to thank all concerned for your sterling efforts in 2000. It is with a heightened sense of optimism that we enter 2001.



Dandu Pughiuc
Chief Technical Adviser

Ballast Water News is the quarterly newsletter of the Global Ballast Water Management Programme (GloBallast). GloBallast is a cooperative initiative of GEF, UNDP and IMO to assist developing countries to reduce the transfer of harmful organisms in ships' ballast water, through the implementation of IMO ballast water management guidelines.

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The views expressed in Ballast Water News are not necessarily those of GEF, UNDP or IMO.



Programme Highlights

National Workplans Developed Perhaps the biggest practical achievement of the programme during the last three months has been the completion of draft national workplans by all six pilot countries. Brazil, China, India and South Africa chose to develop their workplans through a workshop exercise, attended by the full range of stakeholders in the ballast water issue. The PCU Technical Adviser attended these workshops and assisted with workplan development.

Ukraine developed its workplan through a Country Task Force meeting and a call for proposals from the various sectors. The PCU Technical Adviser then visited Odessa and assisted with compiling the final draft plan. In the case of the Islamic Republic of Iran, a consultant, Mr Alan Taylor, was engaged by the PCU to visit the country and work with Iranian officials to develop their plan.



Examples of the GloBallast National workplan development workshops, China and Brasil.

The draft National workplans were presented to the second GPTF meeting in December 2000 and received substantive approval. They clearly outline the activities, timelines and budgets for the execution of the GloBallast programme in each pilot country. Some technical issues remain to be addressed for each workplan, in consultation with the PCU.

Programme funds are now flowing to each country and practical implementation of activities has commenced.

GPTF Meets The second meeting of the Global Project Task Force, comprising all six pilot countries, UNDP, IMO, the global shipping industry and international environmental NGOs, was held at IMO in London on 7 and 8 December. In addition to giving substantial approval to the six national workplans, the GPTF also heard end-of-year progress reports from each country and the PCU.

The meeting was attended for the first time by the Chairmen of both MEPC (Mr Mike Julian) and the MEPC Ballast Water Working Group (Mr Mike Hunter). Both Chairmen expressed positive surprise at the significant and practical progress that has been achieved by the programme to date, and commended the six countries and the PCU for their efforts. This was echoed by representatives from the global shipping industry, UNDP and Friends of the Earth.

The PCU also briefed the GPTF on the activities that are planned to commence in early 2001, including ballast water risk assessments and port baseline surveys for each demonstration site, the development of global training packages in various aspects of ballast water management and the review of legislation and regulations in each country.

Finally, the GPTF received a presentation from Guest Speaker Dr Ron Thresher of the Australian Centre for Research on Introduced Marine Pests (CRIMP). This provided an excellent opportunity for the six developing countries to learn from Australia's ballast water experiences.

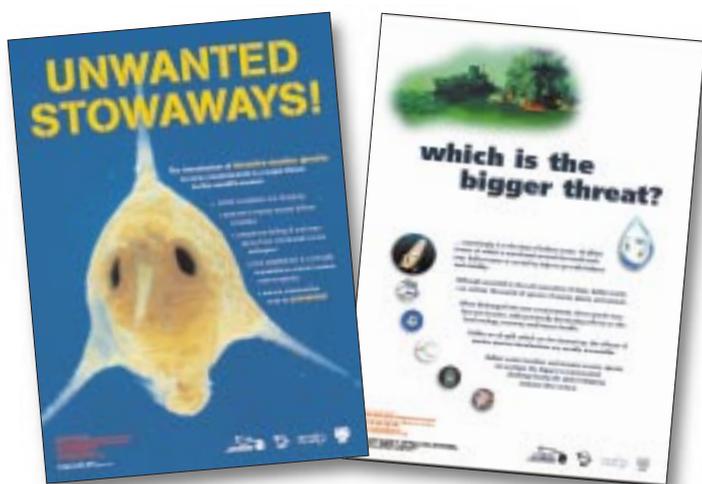
UN Links Strengthened A very positive development during the October – December quarter was the strengthening of links with other UN bodies.

The PCU Chief Technical Adviser attended a UN Train-X course developer's workshop in New York. The foundations were laid for a cooperative arrangement between GloBallast and the UN Train-Sea-Coast programme, for the development of modular training packages in various aspects of ballast water management. This would include involvement of the Train-Sea-Coast centres located in two of the programme's pilot countries, Brasil and South Africa.

An alliance was also formed between GloBallast and the World Maritime University (WМУ) in Malmö, Sweden. WМУ will advise and assist the review of ballast water legislation and regulations, both globally and in each pilot country, and develop model ballast water management legislation.

Finally, contact was made with the World Health Organization (WHO), with a view to developing cooperative arrangements for the prevention of transfer of cholera and other diseases in ballast water. WHO attended the second GPTF meeting and the PCU will follow-up this link in the New Year.

Awareness Raising Commences One of the biggest barriers to effectively dealing with the ballast water problem has been identified as a lack of awareness amongst all but the most specialised of audiences. In response, GloBallast is investing strongly in awareness raising efforts. The first products, a set of three posters, came off the production line last quarter. These have been distributed widely around the world and versions are now being produced in the languages of the six pilot countries. Additional awareness raising activities will be developed as the programme progresses.



Examples of the GloBallast awareness raising posters

To obtain full-size (70cm x 50cm) originals of the posters (free of charge) please contact Matthew Baker at the PCU. Email mbaker@imo.org.

Web-Site Goes Online The programme's new web-site, <http://globallast.imo.org>, went online at the beginning of December. It contains the following:

- an overview of the 'ballast water problem',
- a description of the international response,
- a copy of the IMO ballast water guidelines,
- an overview of the GloBallast programme,
- a section on ballast water treatment, including the global Ballast Water Treatment R&D Directory,
- a section on ballast water legislation,
- the IMO library ballast water collection,
- links to other ballast water directories and databases, such as the Smithsonian's AIRD,
- issues to date of Ballast Water News (PDF files),
- links to other relevant sites, and
- PCU contact details.

Other organizations are invited to link with the site, which will remain 'alive' and be updated regularly.

IW Meeting Attended The GloBallast programme is funded under the International Waters (IW) portfolio of the Global Environment Facility (GEF). To date this portfolio has allocated over US\$400 million to the sustainable management of international waters and there are currently 18 active IW projects covering the full spectrum of coastal and oceans management issues.

In order to share experiences between this large range of projects and to begin development of best practices for international waters management, the GEF held its first International Waters Conference in Budapest, Hungary, from 14 to 18 October 2000.

GloBallast was represented by the PCU Chief Technical Adviser and the CFPs from India and Ukraine. The conference provided an excellent opportunity for the relatively young GloBallast programme to learn from the experiences of the more advanced IW projects. It also helped to raise awareness amongst the global community about ballast water issues.

For further information: www.iwlearn.org/iwvc2000.

ICHCA Initiative Supported The international cargo handling industry has become proactive in helping to address the problem of invasive marine species in ballast water. On 20 November the International Cargo Handling Coordination Association (ICHCA), a global umbrella group representing the interests of a huge range of cargo handlers, organized and hosted a one day international conference in London entitled 'Ballast Water: Global Awareness'. ICHCA's objectives were to bring the issue out of the realm of specialists and into the broader audience of industry, focussing the minds of the private sector on this major environmental challenge. GloBallast participated actively.

For further information: www.ichcabulk.org.

R&D Directory Released In October 2000 the PCU released the first edition of a global ballast water treatment R&D directory. The directory is a response by the programme to a long-standing call for such an initiative. There are a large number of R&D projects underway around the world looking at new methods for treating ballast water to remove or kill organisms. Until now, it has been extremely difficult to obtain a quick appreciation of who is doing what where in this field. The directory has proved popular and has already been updated four times. It is available as a document from the PCU or can be accessed as a database on the GloBallast web-site (see <http://globallast.imo.org> – Ballast Water Treatment).

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Guest Speaker

**Mr Michael Julian, Chairman
IMO Marine Environment Protection
Committee**



Mr Julian, of the Australian Maritime Safety Authority, has chaired MEPC since 1998, guiding the development of the new ballast water legal instrument through some critical stages.

IMO's Marine Environment Protection Committee (MEPC) has been developing an international treaty on the management of harmful aquatic organisms in ships' ballast water since the early 1990's. While it may be viewed with concern by some that the draft convention is not yet finalised, it is critical to its successful adoption by a diplomatic conference as well as those at sea, who will have to conform to its requirements, that the measures to manage ballast water are clearly understood, practical, safe, environmentally acceptable and cost effective. Taking additional time to reach agreement on outstanding issues should therefore be seen in a positive light.

There are several reasons that have slowed the process. The MEPC Ballast Water Working Group has so far been unable to resolve two key factors. Firstly, determining acceptable standards for the effectiveness of ballast water treatment and secondly, determining treatment options which meet the 'agreed' criteria of ship safety, environmental acceptability and cost effectiveness.

Because of the enormous engineering and scientific difficulties of the task, determining acceptable outcomes to the above two factors has proven far more complex than finding solutions to most of the other ship-sourced pollution threats which MEPC has faced in the past. Reaching agreement in 1992 on the requirement for new oil tankers to be built with double hulls and the phasing out of single hull tankers, was relatively simple compared to the Committee's work in finding solutions to the 'ballast water problem.'

So far the only 'accepted' ballast water management technique has been ballast exchange at sea. However, because of ship safety and effectiveness limitations, this method has always been recognised by MEPC as only an interim option. The safety of the ship and those on board are paramount. Clearly, ballast exchange at sea should only be carried out in accordance with the ship's Ballast Water Management Plan that must be approved by the relevant classification society and endorsed by the flag administration.

Several millions of dollars have been spent in a number of countries to find acceptable ballast water treatment

options. So far however, the elusive 'silver bullet' has yet to be found. The problem is a 'catch 22' i.e. until a standard for measuring treatment effectiveness is agreed, the ability to determine acceptable treatment options remains uncertain.

It was very pleasing to note in the last edition of Ballast Water News a range of new ballast water treatment R&D projects. Also of significance is the fact that the first shipboard ballast water treatment equipment, the OptiMar system, has been installed on the cruise ship Regal Princess. Subject to test results and if proven effective, this type of equipment might be used by other ships with similar ballast volumes.

The holding by the GloBallast programme of the International Ballast Water Treatment R&D Symposium & Workshop at IMO from 26-30 March 2001, will provide an ideal opportunity to bring together key experts to assist the MEPC working group in developing the required standards and treatment options (contact sraaymak@imo.org).

The last meeting of the MEPC's ballast water working group held in October 2000 confirmed that it would continue developing the draft convention on a two tier approach. Tier One is the base level requirement that would apply to all ships, including the mandatory carriage of a Ballast Water & Sediment Management Plan, Ballast Water Record Book and a requirement to carry out a ballast water management procedure after a phase in period. Recognition was given that procedures may differ for new ships.

Tier Two would apply only in prescribed ballast water management areas. However, further work is required to determine the extent of the proposed second tier requirements, including how UNCLOS might apply.

The Committee agreed that it would be appropriate to develop a joint MEPC/MSC (Maritime Safety Committee) circular, explaining the need for ballast water and sediment management options to be taken into account when designing and building new ships. A draft has been developed for agreement in 2001.

It had been anticipated that the draft ballast water convention would have been sufficiently advanced by now to enable a diplomatic conference to be held early in 2002. It now appears that this will have to be put back a further year.

The most important issue is therefore to ensure that the outcome of the considerable time and effort by many hundreds of people in finding a solution to this problem, provides a convention with regulations that are practical, safe, environmentally acceptable and cost effective. It is up to the working group and the MEPC to achieve this goal within the next two years.

MJ

~ ~ ~ NEWSFLASH ~ ~ ~

**IMO Library Ballast Water Collection
has grown by 270%**

Check out: <http://globallast.imo.org>

MEPC Update

IMO's Marine Environment Protection Committee (MEPC) is the international forum through which IMO member countries negotiate, develop, agree, review, amend and administer international conventions and other instruments for the prevention of pollution from ships.

The 45th meeting of MEPC was held in London from 2 to 6 October 2000. As reported by the Chairman Mr Mike Julian in his 'Guest Speaker' article, MEPC's Ballast Water Working Group continued to make good progress on developing the new international ballast water convention.

At MEPC 45 chairmanship of the Ballast Water Working Group changed from Mr Dennis Paterson of Australia to Mr Mike Hunter of the UK. Mr Paterson had chaired the working group since its inception. He is widely acknowledged as being one of the main driving forces in guiding the development of the ballast water convention through the complex negotiations and myriad of challenges of the IMO process. He continues to be involved in global efforts to solve the ballast water problem.

Mr Hunter had previously been a delegate on the working group. He assumes its chairmanship with the benefits of an in-depth appreciation of the previous proceedings, the IMO system and maritime operations.

The Ballast Water Working Group was set a number of tasks during MEPC 45, including:

- further develop draft text for the convention,
- consider standards for the evaluation of new ballast water treatment methods,
- consider the standardization of ballast water sampling techniques,
- consider the responsibilities of Port, Flag and Coastal States under the convention,
- consider the contents of the Ballast Water Management Plan and Ballast Water Record Book to be required under the convention,
- consider regulations regarding reception facilities for ballast water.

Substantial progress was made by the working group on the draft text for the convention, based on the two-tier approach described by Mr Julian in his 'Guest Speaker' article. It was agreed that delegations need more time to consider the implications of designated ballast water management areas under Tier Two, to be considered in more depth at MEPC 46.

In relation to standards for the evaluation of new ballast water treatment methods, the working group heard that the GloBallast programme is convening an international workshop on this issue in March 2001. The outcomes will be submitted to MEPC 46 for consideration.

Germany submitted the results of a review it had done on ballast water sampling techniques and Dr Stephan

Gollasch of the German delegation was asked to chair an informal inter-sessional correspondence group of relevant experts, to develop this matter further for the next meeting.

The working group agreed to consider the responsibilities of Port, Flag and Coastal States at its next session.

The working group agreed on minimum mandatory requirements for shipboard Ballast Water Management Plans and Record Books.

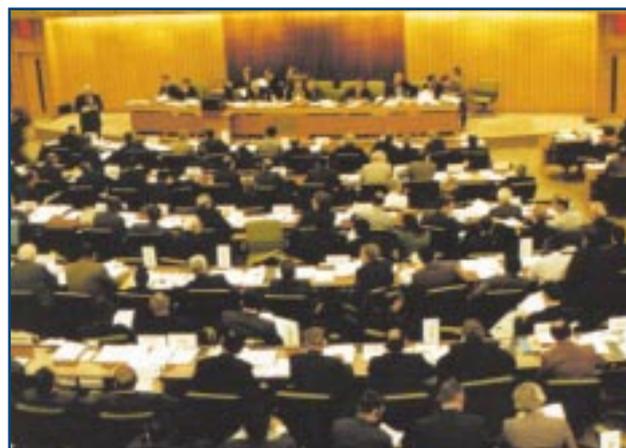
The working group agreed that due to various concerns, that there would be no mandatory requirement for ports to provide, or ships to use, ballast water reception facilities.

The working group concluded that the fundamental basis of a draft legal instrument for ballast water management is now established. The US offered to consolidate what had been achieved to date and to submit a complete text to MEPC 46. This offer was accepted.

The working group agreed to work towards resolving all outstanding issues in time to submit a draft final text to MEPC 48 (2002) with a view to convening a Diplomatic Conference in 2003.

For further information on the status of the new ballast water convention refer to <http://globallast.imo.org> – The International Response.

SR



~ ~ ~ ANNOUNCEMENT ~ ~ ~

**International
Ballast Water Treatment
R&D Symposium & Workshop**

**IMO London
26-30 March 2001**

Contact: sraaymak@imo.org

Unilateral Actions Surge Ahead

Of great concern to both IMO and the global shipping industry is that in the absence of a single, uniform, international legal instrument for the regulation of ballast water management, individual jurisdictions at the national, provincial and local level are proceeding with implementing their own regulatory regimes.

The danger of this fragmented, patchwork approach is that differences may arise between each regulatory system. Because shipping is an international industry, with ships passing across jurisdictional lines in order to conduct trade, differences between regulatory systems can create extreme compliance difficulties and significant cost implications for shipping.

Despite these problems, many jurisdictions which are most concerned about protecting their coastal and marine resources from the dangers of invasive marine species, are implementing their own ballast water management legislation and regulations.

The web site of the International Association of Independent Tanker Owners (INTERTANKO) provides profiles of national ballast water legislation (www.intertanko.com/tankerfacts/environmental/ballast/ballastreq.htm.)

Below we take a look at the regulatory responses of Australia and the US States of California and Washington. The US State requirements are in addition to those imposed Federally under the US *National Invasive Species Act 1996*. We also briefly reference regulatory arrangements for ballast water imposed at the local level by individual ports.



Australia

From July 2001, new arrangements under the Australian *Quarantine Act 1908* for managing the risks posed by exotic marine pests will apply to all international vessels visiting Australian waters.

The new regulations have received widespread support from stakeholders in government and the shipping industry. The mandatory aspects of the new arrangements include:

- reporting to the Australian Quarantine and Inspection Service (AQIS) regarding ballast water arrangements. Vessels that do not carry ballast water will still be required to report;
- if required, undertaking ballast exchange and/or other treatment and management options as directed by AQIS before discharging ballast;
- re-submission and/or updating of ballast water information if voyage details have altered;
- access to safe ballast water sampling points;
- disposal on land of sediment resulting from ballast tank and/or hold cleaning; and

- no discharge of ballast water within Australian waters without written permission from a Quarantine officer.

Vessels intending to discharge ballast water in Australian waters will be able to manage their ballast water en-route by using the Australian Ballast Water Decision Support System (DSS).

The DSS performs a tank-by-tank risk assessment based on information supplied by the ship's master, and allows international vessels to determine before they arrive in Australian waters if their ballast water poses a risk of introducing exotic marine pests. Tanks identified as carrying high-risk ballast water will require treatment and/or management by a method acceptable to AQIS, including:

- exchange of ballast water at sea through sequential exchange, flow-through or dilution;
- non-discharge of high risk ballast tanks;
- tank-to-tank transfer, preventing discharge of ballast water from 'high risk' tanks; and
- comparable treatment options as developed.

To ensure accurate reporting by ships' masters, AQIS will be verifying information and advising masters about the records that must be maintained.

Further information:

Stephen Rowland, AQIS Seaports Program

Email stephen.rowland@aqis.gov.au.



California

On 1 January 2001 the Californian *Ballast Water Management for Control of Nonindigenous Species Act* became effective. It is administered by the California State Lands Commission (CSLC).

The Act requires vessels calling at Californian ports to adopt good housekeeping practices to minimize the uptake and discharge of nonindigenous species; develop and maintain vessel-specific ballast water management plans and to provide crew training.

All vessels carrying ballast water and/or associated sediments into Californian State waters after operating outside the US Exclusive Economic Zone must conduct one of five ballast management practices:

- carry-out a mid-ocean ballast water exchange before entering State waters;
- retain ballast water on-board;
- use an alternative method approved by the CSLC;
- discharge all ballast water to an approved shore-side facility; or
- carry-out a ballast water exchange in an area agreed by the CSLC.

All vessels must report their ballast practices per voyage and retain this information on-board for two years. To avoid duplication of Federal record keeping provisions,

the CSLC has adopted the US Coast Guard's Ballast Water Report Form.

The Californian legislation also provides for a ballast water management fee of US\$400 per voyage, field inspection of ballast water and sediments from vessels and enforcement with civil penalties.

There is also a state-wide programme of biological field surveys to assess the extent of non-indigenous aquatic species and a research programme for the evaluation of alternative ballast water treatment techniques.

Further information:

*Karen Hart, West Coast Ballast Outreach Project
kdhart@ucdavis.edu.*



Washington

On 24 March 2000 Washington became the second US State to pass legislation regulating the way that ships manage ballast water, through Substitute House Bill (SHB) 2466.

The Bill became law in July 2000, is administered by the Washington Department of Fish and Wildlife and requires the following:

- all ships (including coastal shipping) entering a Washington port and planning to discharge ballast water must undertake ballast exchange not less than 50 miles from shore prior to entering the port. Exemptions may be given for safety reasons (e.g. inclement weather) until 1 July 2002, whereafter all ships will have to exchange or treat their ballast water regardless of weather conditions or other safety factors;
- shipboard ballast water operations must be recorded and reported;
- ballast water must be tested prior to discharge.

Non-compliance may result in civil penalties.

To stimulate the development of new technologies as alternatives to ballast water exchange, SHB 2466 also mandates the initiation of a ballast water treatment R&D pilot project.

Further information:

*Scott Smith, Washington Dept of Fish & Wildlife
smithss@dfw.wa.gov.*



Port Authorities

To compound the complexity of the rapidly developing ballast water regulatory picture, individual port jurisdictions are also playing a significant role. The Port of Vancouver has had mandatory requirements for certain ships to undertake ballast exchange at sea, backed-up by compliance sampling and testing, in place since 1996. The ports of Oakland, Stockton and Humboldt Bay in California have also implemented port-specific ballast water management requirements.

At the Port of Scapa Flow in the Orkney Islands, Scotland, ships wishing to discharge ballast at the Flotta Terminal can do so only to a shore-based reception facility.

In Buenos Aires, Argentina, quarantine health authorities require ships arriving from WHO listed cholera areas to treat their ballast water with chlorine, before discharge.

At this time, several other countries and individual ports around the world have in place or are considering their own ballast water management regimes, as are several additional states in the US.

These unilateral regulatory responses raise a number of significant concerns, including discrepancies and duplication between different regimes that apply to the same international industry; the apparent arbitrary basis for some of the requirements; real, practical impediments to achieving some of the requirements and the granting of maritime regulatory powers to agencies with possibly limited experience in dealing with shipping issues.

The prerogative of coastal states to protect their coastal and marine resources from shipping impacts must be maintained. However, a piece-meal, disjointed approach is counter-productive when dealing with a trans-boundary, global industry such as shipping. The vital need for a uniform and effective international law on ballast water could not be greater than it is right now.

SR

Have your say!

Please feel free to submit articles or letters to the editor for consideration for publication in **Ballast Water News**
sraaymak@imo.org

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<http://globallast.imo.org>



Progress Report

Activities Undertaken October – December 2000:

- ✓ MEPC 45 attended (London 2-6 Oct).
- ✓ PCU missions to Brasil and Ukraine undertaken.
- ✓ Consultant's mission to Iran undertaken.
- ✓ Web site online.
- ✓ 1st awareness materials (posters) distributed.
- ✓ 1st case studies (Brasil, S. Africa, Ukraine) undertaken.
- ✓ Detailed planning for risk assessments underway.
- ✓ Detailed planning for port surveys underway.
- ✓ Detailed planning for R&D symposium underway.
- ✓ GEF International Waters meeting attended (Budapest).
- ✓ ICHCA ballast water conference attended (London).
- ✓ Links formed with UN Train-Sea-Coast programme.
- ✓ Links formed with WMU for legislation review.
- ✓ 2nd GPTF meeting held (London 7-8 Dec).
- ✓ National Workplans developed and approved.
- ✓ 3rd issue of Ballast Water News produced.



Activities Planned January – March 2001:

- Continue implementation of in-country activities.
- Employ additional Administrative Assistant at PCU.
- Process port survey coordinator consultancy.
- Advertise/process risk assessment consultancy.
- Attend ROPME meeting, Kuwait.
- PCU mission to WMU, Malmö.
- Publish 1st case studies.
- Commence second case studies (China, India, Iran).
- Produce second round of awareness materials.
- Review/consolidate information clearing house function.
- Further develop regional cooperation at each site.
- Hold ballast water treatment symposium and workshop (London 26-30 March).
- Prepare for MEPC 46 (23-27 April).
- Produce 4th issue of Ballast Water News.



More Information?

Check out these web-sites:

(these are additional sites not listed in BWN Issues 1 and 2):

- www.ballast-outreach-ucsgep.ucdavis.edu/ – US West Coast Ballast Outreach Project
- www.projects.dnv.com/embla/ – DNV EMBLA system (voyage-based ballast water risk assessment)
- www.conferences.uni.edu/ – 2nd Marine Bioinvasions Conference
- www.aquatic-invasive-species-conference.org – 11th International Conference on Aquatic Invasive Species
- www.ncr.dfo.ca – Canadian Department of Fisheries and Oceans
- www.anstaskforce.gov - US National Aquatic Nuisance Species Task Force
- www.ices.dk/pubs/itmo.pdf - ICES Code of Practice on the Introductions and Transfers of Marine Organisms 1994.

More web-sites next issue. To contact the PCU – see details on front page.



Photo credit : Gustaf Hallegraef