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ADMISSIBILITY OF CLAIMS FOR COMPENSATION FOR ENVIRONMENTAL DAMAGE UNDER THE 1992 CIVIL LIABILITY AND FUND CONVENTIONS

Submitted by The International Tanker Owners Pollution Federation Limited

SUMMARY:

- Natural fluctuations in the composition, abundance and distribution of populations of marine animals and plants can be both frequent and dramatic. Such fluctuations are a feature of the normal way such ecosystems function.
- Marine species have evolved reproductive and other strategies that enable them to withstand and to recover from natural changes in their physical, chemical and biological environment.
- These same mechanisms enable marine habitats and populations to recover from events such as accidental marine oil spills, the effects of which have been extensively researched and are generally short-term and predictable.
- Man's ability to speed up the natural recovery of damaged habitats and populations beyond appropriate cleanup measures is currently limited. There is potential, however, for more innovative approaches to reinstatement and this should be encouraged by the 1992 Fund so that the current provisions within the 1992 Civil Liability and Fund Conventions are fully utilised.
- Greater encouragement should also be given to conducting properly designed and managed studies and monitoring programmes after major oil spills in order to assess the impact on natural resources and the need for reinstatement measures. Whilst the cost of many such studies may already be admissible under the present claims admissibility criteria of the 1992 Fund, consideration might be given to clarifying the position in the 1992 Fund's Claims Manual.
- In view of the above, it is considered premature to regard the existing provisions for reasonable reinstatement measures as inadequate, especially as no such claims have yet been submitted for consideration by the 1992 Fund. If this clear boundary were to be abandoned it would be inevitable that the 1992 Fund would be confronted by large environmental damage claims, many of which are likely to be highly speculative and based on questionable science and contentious economic valuations. Acceptance of such claims would be contrary to the accepted principle that the purpose of the international compensation Conventions is to ensure that those who directly incur costs or suffer financial loss as a result of an oil spill from a tanker are promptly compensated and thereby placed in the same economic position as if the spill had not occurred.
- Politicians and the media often express the public's frustration at damage to the environment resulting from an incident. Reliance on natural recovery to repair this damage is often viewed as allowing the polluter to escape paying an appropriate financial penalty. One approach to meeting these concerns, which does not conflict with the international compensation conventions, is that adopted by Canada where a separate fund has been established with monies awarded by courts under national legislation and other sources to pay for environmental remedial projects.

1. INTRODUCTION

1.1 The definition of Pollution Damage in the 1992 Civil Liability and Fund Conventions provides that "compensation for impairment of the environment other than loss of profit from such impairment shall be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken". With the exception of clean-up costs, no claim has yet been submitted to the 1992 Fund for reinstatement measures, as far as the authors of this paper are aware. Despite this fact, there are those who consider that the existing provisions for compensating for environmental damage do not go far enough and that they therefore represent a major shortcoming of the international compensation regime. This, for example, is the stated view of the European Commission. In its communication dated 6 December 2000 the Commission therefore proposes that "compensation of damage caused to the environment should be reviewed *(by the IMO or 1992 Fund)* and widened in light of comparable compensation regimes established under Community law." Further, it suggests that "the existing coverage of reinstatement costs could be expanded to include at least costs for assessing the environmental damage of the incident as well as the costs for the introduction of components of the environment equivalent to those that have been damaged, as an alternative in case reinstatement of the polluted environment is not feasible."

1.2 This paper aims to demonstrate that it would be premature and unnecessary for the 1992 Fund to extend the definition of Pollution Damage beyond reasonable reinstatement measures. It is suggested, however, that more encouragement might be given to the use of innovative measures and to post-spill studies establishing the need for such restoration.

2. DEFINITIONS

2.1 Discussions of environmental damage are frequently confused because of lack of common understanding of certain key terms, some of which are used throughout this paper.

Marine environment – an all inclusive term used to describe the physical, chemical and biological characteristics of the sea, including estuaries and other areas that form a link between the land, freshwater and marine ecosystems.

Ecosystem – a sub-division of the marine environment used to describe communities of organisms that interact with each other and that live in a situation with particular physical and chemical characteristics (e.g. a coral reef ecosystem, estuarine ecosystem).

Habitat – usually a sub-division of an ecosystem and used to describe a place where particular plants and animals live (e.g. salt marsh habitat, rocky shore habitat).

Species – a specific type of animal or plant that has particular characteristics that distinguish it from other plants and animals, including ones that look very similar.

Population – group of individuals of the same species, commonly forming a breeding unit, that share a particular habitat at a particular time.

Community – populations of different species that live together in a state of dynamic equilibrium within a prescribed area or habitat.

Recovery – re-establishment through natural processes of a biological community in which the plants and animals characteristic of that community are present and functioning normally after a period of change caused by natural or man-induced factors. The species composition and age structure of the populations within a recovered community may well be different from those present before the event.

Reinstatement/Restoration – In the context of this paper these two terms are used synonymously to describe man's attempts to speed up the process of natural recovery. Neither term should be interpreted to mean a return to the precise physical, chemical and biological situation that existed prior to the spill. This is an unrealistic concept given the lack in most cases of long-term pre-spill measurements and the fact that it will be impossible to state with certainty that the communities are the same as, or different from, those that

would have persisted in the absence of the event because of natural fluctuations and other man-induced changes

3. THE NATURAL VARIABILITY OF THE MARINE ENVIRONMENT

3.1 Marine ecosystems are highly complex and natural fluctuations in the composition, abundance and distribution of the populations of the resident species are both frequent and a feature of the normal way such ecosystems function. Some of these natural fluctuations can be short-lived and local and be caused by a one-off event such as a severe storm or by a seasonal climatic change (e.g. monsoon rains). Longer-term, more dramatic and widespread changes may result from an alteration in weather patters, tidal levels or ocean currents. Perhaps the best known example is El Niño, which disrupts the ocean-atmosphere system in the Pacific. During an El Niño event the rise in sea surface temperature in the Eastern Pacific cuts off the upwelling of nutrient-rich water off Peru, causing a drastic decline in the productivity of the coastal waters. The resulting reduction in fish stocks (particularly anchovies) off the coast not only spells short-term disaster for commercial fishermen but also for the huge populations of seabirds and marine mammals that rely on the fish for food. As a consequence, during an El Niño year vast numbers of these animals die and little or no breeding takes place. And the effects are not restricted to Peru since the change in sea temperature extends for many thousands of miles, with major consequences for marine organisms, seabirds and marine mammals throughout the entire Pacific region.

3.2 As well as considerable natural variability it has to be recognised that a wide range of human activities can also affect particular populations, habitats or entire marine ecosystems. Traditional pursuits, such as commercial fishing, frequently adversely affect non-exploited species, either directly through killing animals and plants caught up in nets, or by removing excessive quantities of commercial species, thereby depriving other animals, such as seabirds, of their basic food supply. Coastal development and effluent inputs from land-based industries can also bring about long-term, chronic effects, leading to changes in ecosystems.

3.3 Animals and plants that live in the sea have evolved over millions of years to be resilient to both short and longer-term changes in the physical, chemical and biological characteristics of where they live and to recover quickly when conditions once again become more favourable. Without such mechanisms many marine species would have long since become extinct. However, recovery potential varies between species and different life stages. This is what determines their vulnerability to an environmental disturbance, whether natural or man-induced.

4. NATURAL RECOVERY POTENTIAL

4.1 Given that a ‘normal’ state for marine populations is one of considerable annual or seasonal variation it follows that a return to 'normal' after an event that causes change may not mean that the re-established biological communities have exactly the same species composition or age structure as was there before. In point of fact, it will be impossible to state with certainty that the communities are the same as, or different from, those that would have persisted in the absence of the event because of natural fluctuations. These factors are taken into account in the most widely-accepted definition of environmental recovery which states that "recovery is marked by the re-establishment of a healthy biological community in which the plants and animals characteristic of that community are present and functioning normally".

4.2 Many species of marine organisms reproduce by releasing vast numbers of eggs which are widely distributed in the sea by currents. Of the tens of thousands or millions of eggs released by each adult, only one or two will usually survive to become adults due to enormously high levels of natural mortality, which can exceed 99.99%. Thus, most eggs and young stages will be eaten by other animals as they develop or will fail to find suitable conditions which will allow them to develop into adults. However, this vast production of

eggs and other young stages ensures that there is a considerable reservoir for the colonisation of available areas and the replacement of any adults which have been killed as a result of short-term unfavourable conditions. This is demonstrated by the rapid re-colonisation or rocky shorelines after a very severe storm or other event that denudes the rocks of living organisms. The spores of marine algae ("seaweed") rapidly settle and grow, followed a short while later by the animals that feed on the algae. Within a short period the animals and plants characteristic of a rocky shore will have returned, with the normal balance between them being established after a few years.

4.3 Such rapid recovery after natural 'disasters' does not necessarily apply in the case of all marine plants and animals. Those that are longer-lived, slow to reach sexual maturity and which produce fewer eggs or offspring may take far longer to recover from the effects of adverse physical, chemical or biological changes. However, even though their recovery potential may, at first sight, appear poor, many such species have also evolved mechanisms to overcome natural losses. Some species of seabirds, for example, have been shown to mature earlier and to have extra broods after a period of population decline. The severity of any impact is also less if only a part of the population is affected. In many cases the loss of juvenile and sub-adults can be overcome more easily than if a large proportion of the parent population is killed. This has been observed with seal populations. As with short-lived species, migration of adults and juveniles from unaffected neighbouring areas can also enhance the recovery process. This is often demonstrated by North Sea bird populations when they suffer dramatic mortalities after severe weather conditions.

4.4 These natural recovery mechanisms also serve marine ecosystems, habitats and populations well after an oil spill or other similar acute event that causes short-term adverse conditions.

5. THE EFFECTS OF OIL SPILLS

5.1 The severity of the effects of an oil spill on natural resources will depend on a number of factors, including the type and amount of oil and its behaviour once spilled; the physical characteristics of the affected area; weather conditions and season/time of year; the type and effectiveness of the clean-up response; and the biological characteristics of the area, in particular the sensitivity of the affected habitats and resident species to oil pollution and the ability of those species to recover from losses.

5.2 It is frequently difficult to establish the precise extent and likely duration of damage caused by an oil spill against the background of natural and other man-induced changes. This is especially the case if there have not been any long-term baseline measurements of the particular habitats or populations before the spill.

5.3 Because of the complexity described above, caution must be exercise when generalising about the effects of oil spills on marine ecosystems, habitats and species. However, such effects have been extensively researched for more than 30 years and so the extent of scientific knowledge and the ability to predict the nature and duration of impacts is better than for many other types of marine pollutant.

5.4 What has been learnt from this research is that although animals and plants that live below the water surface can sometimes be affected by the toxic components in spilled oil, in general the most vulnerable marine species and habitats are those that are at risk from being physically contaminated by floating oil. Salt marsh and mangrove areas are examples of habitats which are vulnerable to oil pollution and where experiments have demonstrated the viability of restoration measures. It has proved possible to assist and accelerate the natural recovery process with replanting programmes instituted after oil spills.

5.5 Sea birds which use open waters to feed or roost are easily harmed or killed by floating slicks. Although oil ingested during preening may be lethal, the most common cause of death is from drowning, starvation and loss of body heat following damage to plumage by oil. Nevertheless, the breeding mechanisms discussed

in paragraph 4.3 normally ensure that after a few years there is no detectable impact on populations, even when mortalities from oil contamination are known to have been high.

5.6 Animals and plants that live on the shoreline, between high and low tidal levels, are also frequently exposed to the effects of oil as this is where it naturally tends to accumulate. Such animals and plants are inherently tough since they must be able to tolerate periodic exposure to pounding waves, drying winds, high temperatures, rainfall and other severe natural stresses. This tolerance also gives shoreline organisms the ability to withstand the effects of oil pollution, and their prolific reproductive strategies (see paragraph 4.2) can ensure rapid recovery of any losses.

5.7 What is clear from all the studies carried out following major marine oil spills is that most effects are transient, that is of short duration. Unlike other human activities such as commercial fishing or coastal development, a major spill will only cause long-term damage in truly exceptional circumstances. In such very rare cases it is usually because the oil spill effects are at a time or place with pre-existing adverse conditions (e.g. food shortage, existing changes in community structure or physical nature of the habitat) or possibly because oil becomes trapped in sediments where it constitutes a source of chronic oil contamination.

6. REINSTATEMENT/RESTORATION

6.1 The first stage of reinstatement/restoration of damaged habitats is cleanup, so that physical and chemical conditions are suitable for recovery and re-colonisation by the main plant and animal species that would normally be found there. This cannot be determined by chemical standards alone since different species have different requirements, which vary depending on life stage, seasons etc. 'Aggressive' cleanup techniques (such as high pressure/ hot water washing or sand blasting) can cause more environmental damage than the oil itself. If environmental recovery is the priority, the best approach will often be the careful removal of bulk oil, leaving any residual oil to weather and degrade naturally. Such decisions should be based on the particular circumstances, with a balance inevitably needing to be struck between environmental and socio-economic factors (taking into account all uses – natural and economic – to which the area is put and their relative priorities), as well as the feasibility of cleanup and probable cost.

6.2 Once cleanup has been completed the most appropriate form of reinstatement/restoration may be natural recovery, recognising that this will in many cases be relatively swift and that any further intervention by man may actually delay rather than enhance the process. Natural recovery is therefore likely to be the preferred and indeed the only feasible approach in many cases.

6.3 In some circumstances, however, positive steps beyond cleanup may be warranted in order to encourage natural recovery of a damaged habitat, especially in circumstances where such recovery would otherwise be relatively slow or might be prevented by physical damage caused during cleanup. An example of such an approach following an oil spill would be to replant an area of damaged saltmarsh or mangrove after the bulk oil contamination had been carefully removed and it was confirmed the majority of the plants had been killed. Through such replanting erosion of the area would be prevented and other forms of biological life encouraged to return.

6.4 It is sometimes proposed that whilst little can be done to speed up the natural recovery of a damaged habitat there would be merit in improving another similar habitat within the general area or even creating a new one by engineering. However, this approach (also known as Habitat Equivalency Analysis) rarely if ever benefits the damaged habitat directly and so cannot be regarded as reinstatement as envisaged under the 1992 Civil Liability and Fund Conventions. Rather it is 'compensatory restoration' for loss of use and services while the damaged habitat is recovering naturally (see paragraph 7.5).

6.5 Similar comments might be made about the concept of introducing "components of the environment equivalent to those that have been damaged", as advanced by the European Commission in its communication of 6th December 2000. No examples are given but it is presumed that the concept is similar to Habitat Equivalency Analysis whereby action is taken to improve a certain acreage of an entirely different

habitat because nothing can be done to speed up the natural recovery of the habitat that has been damaged by an oil spill. This concept may have merit on land where recovery of an isolated area may never occur naturally and where there may consequently be ecological benefit in providing some other, albeit different, habitat. However, this is not the case in the sea for the reasons explained in Section 4. It may also in many cases be ecologically unsound to introduce different species into an area or engineer new habitats, thereby upsetting the natural balance of the existing ones. At best such actions can only be regarded as 'compensatory restoration' and not a true attempt to speed up the natural recovery of the damaged areas.

6.6 Whilst it is frequently possible to help restore damaged vegetation and physical structures that help to define a particular habitat, replacement of the animal populations is generally a far more difficult problem. In the case of sedentary or relatively immobile marine organisms it may be technically feasible to carry out an artificial breeding and release programme if the technology exists and the likelihood of a successful and sustained enhancement of the damaged wild population is high. The replenishment of commercial shellfish species (e.g. oysters, clams, lobsters) may, for example, be possible using techniques routinely employed in the mariculture sector.

6.7 The potential for helping to restore populations of highly mobile species such as fish, seabirds and marine mammals is generally extremely limited. It may be possible in the case of seabirds to engineer the local environment to provide more nesting sites. However, care needs to be taken to ensure that this engineering does not disadvantage other species or habitats. Measures to encourage a greater natural survival of juvenile birds in an oil spill damaged population by minimising early predator impact may also be feasible, especially if the nesting colonies are limited in geographical extent. However, once again this type of approach always risks endangering the populations of the predatory species that rely on the eggs and young birds for their own food. Such concerns may be less if the predators have been artificially introduced, as may be the case, for example with rats on islands used by breeding birds.

6.8 Improved survival and enhanced recovery of young birds may also be encouraged by reducing commercial harvesting of fish or shellfish species that the birds use as food (e.g. sand eels). Similar actions may enhance the recovery of marine mammal populations, as might the cessation of culling programmes. A temporary cessation of fishing pressure is also likely to benefit the fish and shellfish stocks themselves. This has been demonstrated following the lifting of fishing bans imposed to protect market confidence after a spill. However, all such measures may prove unpopular with local fishing communities who are only likely to be willing to forego their livelihood for a period if they receive adequate compensation. The irony is that once the ban on fishing is lifted any enhancement of the fish and shellfish stocks is likely to represent a bonus for the fishermen rather than benefit other species in the longer-term.

6.9 Where the species damaged by an oil spill are highly mobile with great natural interchange between different populations over large distances, the replacement of any local losses by importing individuals from elsewhere is unlikely to be warranted, even if feasible. This applies in the case of most seabird populations, which regularly migrate vast distances at different times of the year for feeding and breeding. There is little prospect of introduced individuals remaining in the release area rather than returning to their home colonies or another one many hundreds of miles away.

6.10 Given the complexity of marine ecosystems it follows that there will always be significant limits to the extent to which damage can be repaired by artificial means. However, it should be recognised that the science of restoration is still in its infancy. There is, therefore, ample scope within the existing provisions in the 1992 Civil Liability and Fund Conventions for innovative reinstatement measures following oil spills, possibly based on lessons learned from other situations. It will be important, however, to guard against accepting speculative and unrealistic reinstatement programmes.

6.11 Appropriate studies to assess the impact of a spill and the need for and feasibility of reinstatement measures may well be important in this context (see Section 8). It will also be necessary to ensure that there are strict criteria for assessing whether or not proposed reinstatement measures are 'reasonable'. Such criteria might specify that:

i. there should be a high probability that the measures will significantly accelerate the natural recovery of a damaged habitat or population;
ii. the proposed measures should be technically feasible;
iii. the measures should not themselves result in the degradation of other habitats or in adverse consequences for other natural resources; and
iv. the cost of the proposed programme should be proportionate to the extent and duration of the damage.

6.12 The last criterion recognises that there will always be a finite amount of compensation available under the Civil Liability and Fund Conventions and if the total of established claims exceeds the maximum available, all claims have to be prorated. The situation could potentially arise, therefore, that a very expensive restoration programme, that may be long-term in nature, would jeopardise the position of other claimants who had incurred cleanup costs or suffered actual economic losses.

6.13 Such concerns would be increased were it decided to abandon the present emphasis on reasonable reinstatement measures currently embodied within the definition of Pollution Damage in the 1992 Civil Liability and Fund Conventions. Once this clear boundary was breached various alternative techniques for assessing environmental damages would inevitably be advanced. Many of these would do little to enhance the natural recovery of habitats and populations damaged by oil spills. They would also go against the fundamental principle of compensation under the international regime that it should leave claimants in the same financial position as they would have been had the oil spill not occurred. In the case of damage to natural resources, which cannot be reinstated by artificial means and which are not commercially exploited or owned by defined individuals or groups, there are no recognised claimants and there is no admissible loss.

7. OTHER APPROACHES TO ENVIRONMENTAL DAMAGE

7.1 Reliance on natural recovery is often viewed by politicians, regulators and the public as allowing the polluter to escape paying an appropriate financial 'penalty' for his/her actions. This has resulted in a number of approaches that go beyond reasonable measures of reinstatement, as envisaged under the 1992 Civil Liability and Fund Conventions, where the emphasis is on compensation for economic losses actually sustained.

7.2 In some countries, for example, a formulaic approach to quantifying environmental damage has been adopted which places a value (generally arbitrary) on that part of the marine environment that has allegedly been damaged by a spill. This may be very general (e.g. the seawater itself) or specific to different species or habitats. In most cases such formulae are more akin to fines with any money received not necessarily being used to the direct benefit of the degraded natural resources or even to the benefit of the environment generally.

7.3 In other countries the approach is more sophisticated. In the USA, for example, responsibility for safeguarding natural resources is divided between a large number of Federal and State Trustees. Under the Natural Resource Damage Assessment (NRDA) provisions of the Oil Pollution Act of 1990 (OPA '90) these Trustees are permitted to seek compensation for damage to natural resources, as well as the full costs of assessing such damage.

7.4 The NRDA regulations place considerable emphasis on restoration and reinstatement in order to return injured natural resources and the services they provide to the condition they would have been in if the oil spill had not occurred. In this context "services" include those enjoyed by the public (e.g. bird watching, fishing, and amenities) and ecological services (e.g. breeding areas and food for other species). In placing emphasis on restoration there are clear similarities between the provisions of OPA '90 and the international compensation regime. However, the US NRDA regulations go much further.

7.5 Thus, in order to achieve the goal under OPA '90 of making the environment and public "whole", the NRDA regulations also permit natural resource Trustees at both the Federal and State level additionally to seek compensation for all interim lost services for the period between when the damage occurred and the resources and services have been fully restored. This can result in compensation being sought for the acquisition of equivalent natural resources and/or services that are remote from the actual damage. For example, Trustees may wish to acquire an area of coastal land to protect it from development and thereby secure it for the long-term benefit of species of bird that may have been affected by an oil spill elsewhere, either directly through oiling or through temporarily losing a feeding area (a "service" that might, for example, normally have been provided by an area of damaged saltmarsh). Another approach might be to purchase and install navigation buoys in order to minimise the likelihood of another pollution event in the same area again.

7.6 The difficulty with such approaches is that they are often not directly aimed at restoring the damaged resource and are semi-permanent solutions to short-term losses that will ultimately be addressed through natural recovery. This requires complex calculations to determine how much land or how many navigation buoys are equivalent to the lost services. Not surprisingly, this is often contentious, especially as the Habitat Equivalency Analysis will often be based on contentious computer models and economic valuation techniques. Following the EXXON VALDEZ incident in 1989 substantial sums were paid by the polluter for damage to natural resources, yet twelve years later only a small proportion of these funds has been spent directly on restoring the damaged environment.

7.7 Some of the main economic methodologies that are used to value natural resources are summarised in the table below. Many of them have been criticised as being inherently flawed in the context of the normal functioning of marine ecosystems and to give values that seem out of all proportion to the actual damage. The European Commission in its communication dated 6th December 2000 acknowledges this problem and states that the assessment of natural resource damage should be "quantifiable, verifiable and predictable to avoid a wide variety of interpretations between the various parties to the international compensation regime". This is easily stated but far more difficult to deliver. (N.B. The European Commission is currently undertaking a study on the evaluation of environmental damage in the context of a proposal for a Europe–wide Directive on environmental liability.)

Travel cost methodology: To value the use of a specific area, individuals' travel costs to the area are used as proxy for the price of 'services' provided by that area.

Hedonic pricing methodology: The demand for non-marketed natural resources is estimated indirectly by analysis of commodities that are traded in a market.

Unit value methodology: Pre-assigned monetary values for various types of non-marketed recreational or other experiences by the public are used to value a specific resource.

Contingent valuation methodology (CVM): A range of techniques in which a group of interviewees is asked how much they would be prepared to pay (in theory) to enjoy a benefit from, or how much they would want to receive to tolerate damage to a resource. The result is then multiplied by the number of persons presumed affected by the knowledge that the resource was damaged. Studies have shown that the respondents answers depended less on their valuation of the environment than on their role in society, the information supplied, the way the question was asked, etc. The methodology is therefore inherently unreliable to give consistent and meaningful results and its use is becoming less popular.

7.8 In most cases the financial value of environmental damage calculated with the above methods would not represent compensation under the terms of the 1992 Civil Liability and Fund Conventions since it would not relate to a true economic loss actually sustained by a claimant. In addition, it would be unacceptable that any money received is often not used to reinstate the actual damaged resource (usually because it is not feasible

or natural recovery is likely to be fast) but is instead used for remote projects that are regarded as 'compensatory restoration'.

7.9 Canada, seemingly recognising some of the fundamental problems described above, as well as the potential for confusing compensation with penalties, established an Environmental Damages Fund in 1995. The Fund appears to operate independently of the applicable laws in Canada for compensating those who suffer economic losses as a result of an oil spill.

7.10 The Environmental Damages Fund serves as a special trust account to manage monies that are received as a result of court orders, awards, out-of-court settlements, voluntary payments and, so it is stated, compensation provided through international liability regimes. The Canadian Courts are apparently able to use various Federal laws to direct money to the Fund, including the Canadian Environmental Protection Act, Migratory Birds Convention Act, the Canada Wildlife Act, the Fisheries Act and the Canada Shipping Act. The Environmental Damages Fund is used to remediate damages to the environment, including assessment or research and development work required to support such restoration efforts. Whilst monies received may not always be used to restore the damaged area in respect of which they were received, it is a requirement that any projects have to be in the region/community where the incident occurred. This initiative is seen as both an effective economic disincentive for illegal activities and as a means of providing compensation for environmental damage.

8. STUDIES

8.1 The costs of post-spill environmental studies can at present be claimed under the 1992 Civil Liability and Fund Conventions, so long as the studies are carried out as a direct consequence of a particular spill and concern damage which falls within the definition of Pollution Damage. This includes studies that are related to the need for reinstatement measures.

8.2 It is also stated in the 1992 Fund Claims Manual that any such studies should be practical and likely to deliver the required data. Their scale should be in proportion to the extent of contamination and predictable effects and both the extent of studies and associated costs should be reasonable. It is specifically pointed out that studies of a general or purely scientific character will not be considered as admissible.

8.3 In order to determine whether or not this position remains appropriate it may be helpful to consider the main types of post-spill environmental studies that might be contemplated. These might include:

a. Specific studies related to the feasibility of restoring damaged habitats or populations or assessing potential longer-term effects on populations, some of which may be of commercial importance (e.g. fish and shellfish stocks)

b. Large scale physical, chemical and biological studies of an integrated nature that are designed to assess the overall impact of a spill on various components of the marine environment. The extensive studies funded by the UK Government following the major oil spills from the BRAER and SEA EMPRESS would fall into this category.

c. Studies of particular aspects of the response to a spill, especially those involving unusual oils or novel response techniques, where the lessons learned might potentially improve the effectiveness of the response to future spills around the world. This would lead to potential benefits for both the environment and the contributors to the 1992 Fund in terms of reduced costs.

8.4 In the opinion of the authors of this paper, studies falling under categories 8.3.a and 8.3.b above are not excluded from being admissible under the current criteria. However, in the case of large scale environmental impact assessments attention would have to be given to ensuring that the various studies did not simply repeat past research at other spills, and that they were conducted by suitably qualified and experienced

scientists. It would also be necessary to ensure that the scale and the cost of the studies was in proportion to the damage likely to have been caused. This might suggest that the design and conduct of any such studies should be supervised by a small steering committee comprising representatives from the affected country, from the 1992 Fund and independent international experts.

8.5 Whilst the 1992 Fund has in the past employed experts to assess the effectiveness of certain cleanup techniques such as dispersants in specific circumstances, the concept of a broader assessment of the effectiveness of response operations as envisaged under 8.3.c would go further. In order to ensure that the results of any such studies would be viewed as objective, it is suggested that they would have to be undertaken by independent scientists with no affiliation or connection with the response agencies of the country in which the spill occurred. It should also be recognised that the results of such studies could have implications for the interpretation of 'reasonableness', not only in the long term but also in specific incidents where the value of a certain response measure may be a matter of dispute between government authorities and the Fund's experts at the time the response decisions were made.

9. CONCLUSIONS

The 1992 Civil Liability and Fund Conventions provide compensation on a strict liability basis for the reinstatement of natural resources damaged as a result of oil spills. The admissibility of the costs of different types of reinstatement measures, as well as the costs of associated scientific studies and monitoring programmes, has yet to be fully explored. It is therefore considered premature to state that the present provisions do not go far enough. Steps should, however, be taken by the 1992 Fund (perhaps by revising the criteria for the admissibility of claims) to encourage innovative reinstatement measures and properly designed and managed studies after major oil spills in order to assess the impact on natural resources and the need for such reinstatement measures.