Paper 2: Workshop Overview and Recommendations

1. Introduction

The incidence of oil spill events in Australian waters has historically been low. According to Kay (1987) the then Federal Department of Transport in 1986 received 142 reports of marine oil spills. Almost 90% of these occurred within ports and in 71 cases some type of clean up reponse was undertaken. The largest spill was 55 tons and the smallest estimated to cover an area of three by one metres. Kay reports that 1986 was not an atypical year and points to both the low historical incidence of major spills (greater than 100 tons) and the seemingly, disproportionate effort involved in response - less than 10% of spills are responsible for more than 80% of the total quantity spilled. According to a, risk analysis study undertaken in 198 1 by the Bureau of Transport Economics (BTE), Australia has a 40% chance of at least one spill per year which is greater than 20 tons and a 5% chance of one greater than 120 tons. The study noted, however, that over a ten year period there is a 40% chance of a spill greater than 120 tons.

Hawes (1987) noted that since the adoption of the National Plan to Combat Pollution of the Sea by Oil in 1973, the combined efforts of Federal and State governments and the oil industry have achieved a high level of national preparedness for dealing with both minor and major oil spills. As Hawes noted, there is, however, a strong case for both vigilance and for upgrading and improving the response capacity established under the National Plan.. He observed that the nature of the threat from oil, and other types of hazardous materials transported by sea, was constantly changing. For example, with the decline in production from Australian wells and increased reliance on imported oil products, the quantity of oil carried in Australian waters will increase and the nature of the potential impact will change (with different types of oils being introduced). Hawes also intimated that as with any contingency planning exercise there, is a constant need for "fine tuning"; the National Plan establishes a broad reponse capability which needs to be continually expanded and refined if an "optimum condition of preparedness" is to be achieved.

This workshop marked an important phase in the development of the framework for response to oil spills in Australian waters. For the first time since the inception of National Plan arrangements, the role and requirements of the scientific advice in the overall response effort were separately and specifically examined. While the National Plan and various supplements provide for the use of scientific advice in spill response, and a number of State and Commonwealth agencies have been involved in implementation of scientific aspects of contingency plans, there appeared to be a

pressing need for these activities to be evaluated and co-ordinated if optimum future response efficiency is to be achieved. There was also a strong level of support amongst those involved at operational levels of plan implementation for the specific requirements of the role of SSC to be more fully defined and for important questions on information use and procedural requirements to be addressed.

The workshop was therefore intended to fulfil an important step in the ongoing evolution of National plan arrangements, particularly as there has historically (with a few exceptions) been little attention given to the role of scientific advice in the broader context of the National Plan.

This report summarises the principal areas of discussion during the workshop on aspects of the role of SSC. The discussion also includes the various recommendations made in relation to specific issues of concern. For certain specific items, more detailed background information presented during the workshop is included in later sections of these Proceedings. For convenience of reference, later sections are divided into:

* State Position papers - Section B, which outlines the experience of each agency currently designated as provider of an SSC, the framework for implementation of that role in the State or regional context, the costs and resources involved in that role and some further needs and directions identified to date;
* Information and discussion papers - Section C, which includes papers presented during the workshop by invited speakers. These papers were intended both to update participants' knowledge and to provide a basis for discussion; and
* Background and Reference Material - Section D, which includes some of the resource material used in, or derived during the workshop as well as reference material provided by participants which is considered to have a broad potential application.

The following discussion is divided according to the agreed main phases of scientific input to spill response of preplanning, response (operations) and follow-up. As may be expected, given the cyclical nature of these phases and the interwoven nature of activities in each phase (e.g. monitoring), there is some overlap between topics. This was considered unavoidable by participants and is partly overcome by the presentation of recommendations in a way which emphasizes the need for a holistic (c.f. reductionist) approach to the provision of scientific input.

2. SSC Role in Preplanning

Response Organisation

Participants noted that there has been wide variation in the way in which each State has implemented National Plan arrangements. There are, however, some common elements of each State approach which

can be of assistance in the application of scientific input. For example, the response organisation framework (outlined 'in Paper 12) outlines,, an acceptable chain of command and indicative communications system for response organisation which should enable an SSC to become an effective element of the overall response team. In this respect, the workshop recommended 'that each SSC seek to develop a rapport with other individuals and agencies identified in the response organisation and from that to evolve a clear understanding of the likely requirement for scientific input in all phases of response (R.1) To supplement this initiative, it was agreed that each SSC should endeavour to provide scientific input to all training activities in each State (or region, such as in the case of REEFPLAN).

Mapping

From the State position papers (section B) it is evident that each State has, to various degrees,, commenced a program of coastal and offshore resources, mapping which seeks to enable the nature of threat from an oil spill in various areas to be more quickly and accurately assessed. Participants were in full agreement that such mapping systems were an essential form of scientific input which greatly enhance the accuracy of scientific advice and enable the appropriate decisions regarding possible response options to be made. Concern was expressed that the wide variation in approaches to mapping may cause difficulties of interpretation, however, it was felt that because of the variable ecological and legislative conditions in each State, a uniform approach to mapping was not essential. Participants did, however, endorse the suggestion by Hawes (1987) that a national program of coastal resources mapping would generate information of particular value to oil spill response and may lead to 'economies of scale' in map production. The workshop therefore recommended that the Department of Transport and Communications approach the Australian Environment Council (and other relevant funding agencies) to seek support for an expanded program of coastal and offshore resources mapping preferably.using a uniform approach to Geographic Information System (G.I.S.) development (R.2). Until the outcome of that approach is known, participants agreed to continue to submit proposals to the Department for mapping support via State Committees and that the Department should continue to fund map preparation as funds permit.

Participants viewed examples of overseas mapping projects undertaken by the National Oceanographic and Atmospheric Administration (NOAA) and James Dobbin and Associates and agreed that such atlases are an effective method of information collation and presentation. Examples of Australian studies were also assessed. Those which emphasize the relationship between the characteristics of the resources at risk and the type of response possible, such as the Botany Bay Atlas by the NSW State Pollution Control Commission were regarded as of higher practical value than plain resource maps. It was agreed that because of the need for quick response in most spills, such atlases provide a means for rapid information transfer to the OSC.

There was considerable discussion about the most suitable type of mapping system, with common

agreement that the electronic strategic atlas under development by the Great Barrier Reef Marine park Authority appears an effective way to overcome the updating limitations of present hard copy atlas systems. An indicative output set from the GBRMPA system is included in Paper 24. The workshop therefore recommended that the Department of Transport and Communications circulate information on the GBRMPA system and identify sources of support for the future upgrading of present mapping output to field usable electronic geographic information systems (G.I.S.) (R.3). It was noted during discussion of this issue that the user-friendliness of Apple Macintosh systems, coupled with potential linkage with OSSM output (as noted in paper 17. OSSM 11 is being upgraded as a Macintosh software package) and other databases (e.g. the Macintosh based National Estuarine Inventory recently completed by the Centre for Coastal Management) make the Macintosh a potentially suitable system. The final specification of the most suitable system for each State will require careful evaluation of both hardware and software options.

Use of Dispersants

As outlined in Paper 13, under the National plan three principal options for marine oil spill clean up have been identified:

* leave alone, but monitor;
* control and recovery, using booms, skimmers; or
* disperse using acceptable oil spill dispersants.

The last option is also discussed in more detail in Paper 14.

Participants noted that there are a wide range of uncertainties in the use of dispersants. There appears to be insufficient understanding of the effects of dispersant toxicity, particularly when combined with oil, and other factors affecting potential impact. It was also apparent that the longer term environmental consequences of dispersant use arc not well understood by environmental agencies in each State as there is a lack of Australian research into these effects. During the simulation exercise (No.2 - Paper 21) it was noted that in Queensland there is also a specific constraint on the use of dispersants ▪ a Cabinet directive imposes strict limits on their use.

Participants agreed that the use of dispersants is an important option, particularly where commercially or ecologically important resources downstream of the spill are at risk. Participants therefore recommended that information on dispersant toxicity bc compiled and that guidelines for the use of dispersants be prepared (R.4). This information may, in part, be obtained from studies undertaken by the Marine Science Laboratories in Victoria, based on earlier tests undertaken for the then Department of Transport, James Cook University, Townsville and from work in progress at the Centre for Environmental Toxicology (a joint venture between the University of NSW and the NSW State

Pollution Control Commission) and work undertaken recently by Australian Groundwater Consultants in South Australia. However, participants felt that a specific report 'which draws, together Australian research and results 'and relevant overseas literature (see for example, Papers 25 and 26) would be of widespread practical value and should therefore be commissioned by the Department of Transport and Communications as a special research project.

Rogue Ships

In his discussion of marine salvage operations, Captain Ken Ross from AUSTPAC outlined the special problems posed by inadequately insured vessels. He further observed that these problems may be compounded by the increasing prevalence of inadequately trained crews and poorly maintained foreign registered vessels. He noted that the first question asked by salvors was - is it (the disabled vessel) worth saving in a fiscal sense? Salvors play an important role in the spill response and if there are impediments to their involvement, then both the costs (assuming that they have the specialised equipment and expertise necessary) and the logistical feasibility of mounting a control/containment response may devolve to the response agencies. There was general agreement amongst participants that this uncertainty is undesirable and that all steps should be to ensure that a salvage response capacity should be operable as and when required.

Participants therefore recommended that the Department of Transport and Communications continue their discussions with salvage operators and marine insurance underwriters to clarify procedures for involvement of salvors in oil spill response (R.5). Participants recognised that under present insurance arrangements, this may require response agencies to develop contingency procedures where costs are recovered from National Plan funds initially and later by direct claim against ship owners and insurers.

S h i n Design

Captain Ross noted that current classification rules make no provision for bunker pump out. Most modem tankers carry between 1200 and 1800 tonnes of bunker oil. An essential element of any response to oil leaking from such vessels is thus to prevent further oil escaping to the marine environment (as per Paper 12). Because of current design of bunker facilities, the maximum pump out rate is approximately 6 t./hr. The desirable rate is to remove between 40 - 50 t./hr. from a damaged vessel. To achieve this would require a modification to bunker fuel storage access.

Participants agreed that such a modification would be both desirable in a response context and cost-effective, given the potential for the prevention of damage arising from this source.

Chemical Spills

During the workshop, reference was frequently made to the need for oil spill contingency plans to be extended to provide a response framework in the event of a hazardous chemical spill, Although such events are rare and not covered by National Plan arrangements, it was agreed that oil spill response procedures are logistically suitable for application.

Captain Ross noted that the amount of hazardous cargo carried in Australia waters was increasing, and that the nature of the hazard was rapidly changing. For example some twelve new chemicals are added to world sea cargo each year. Many of these such as tetra-ethyl lead (a petrol additive) are extremely toxic.

Dr Craik mentioned that the Great Barrier Reef Marine Park Authority had begun to address his problem some years previously, as part of a workshop on response to hazardous chemical spills in the Reef Region (Craik, 1984). However, she observed that it poses particular difficulties for agencies working in isolation and therefore urged a cooperative approach between State and Commonwealth environmental agencies to assessment of the nature of the threat, collation of information on transport routes and amounts and identification of response methods.

Participants considered that the issue of chemical spills is of major concern in implementing the role of SSC. It was agreed that a suitable response to the issue was beyond the scope of this meeting. However, as an initial response, partcipants recommended that each State/regional SSC compile information on the nature of the threat in each State/region and that this information become the basis for assessment of possible response methods based on National Plan arrangements (R.6). An effective operational response will require a long term commitment by involved State and Commonwealth agencies to the establishment of an expanded contingency plan for chemical spills in the marine environment.

Resources

Participants noted that one of the major constraints to implementation of the role of SSC at the State and regional levels was the limited resources available. All designated SSCs are part time, with the majority of their work involving other activities. In addition, there has been an historical problem of continuity - few SSCs have been involved in that role for more than five years, thus limiting their exposure to spill experience and their awareness of response procedures.

Given the current restrictions on government funding and the sporadic nature of the oil spill threat there appears little potential for this situation to be improved. This workshop was seen as a verypositive step towards improving the capacity of SSCs to understand and implement the requirements for scientific advice in oil spill response. It was recommended that participants continue to exchange information informally within the SSC 'network' now established (R.7). This recommendation may considerably enhance the collective expertise of all SSCs, especially where operational information (e.g. feedback on the success of a particular response strategy) is obtained by one SSC and passed on to others within the 'network'. It should also enable newly appointed SSCs to quickly obtain information on what is required from them. A suggestion was made that it would be desirable to produce an SSC handbook (R.8). Such a handbook would outline specifically the requirements for implementation of the role of SSC and contain readily accessible operations information. The contents of such a handbook could be based on the "SSC Operations Plan" outlined in Paper 15. Until the handbook is available however, it was noted that there is now a wide range of literature available (see e.g. Paper 26) and training activities undertaken which should enable new SSCs to become familiar with role needs.

Land Disposal

During discussion of specific issues which have been of concern in the development of State supplements and during operations involving spill clean up it was noted that one of the major problems facing SSCs was the requirement to minimise the environmental impact of clean up activities. Most States now have comprehensive environmental legislation which *inter alia* requires due consideration of the potential impact of waste disposal. The removal of reclaimed oil to waste dump sites is often a contentious issue and one which should not be left to be resolved during a spill response. Participants therefore recognised a need for adequate preplanning in this respect and recommended that SSCs prepare guidelines for land disposal as part of operations plans. (R.9). Such guidelines should identify suitable locations and requirements for approval, conditions for site preparation and rehabilitation and monitoring needs.

3. SSC Role in Response

While the operational experience of SSCs has been limited to date, participants identified a number of areas in which future response could be facilitated and improved. These include:

Co-ordination

The guest OSCs for the workshop, David Oliver and Ross Worrall noted that in most incidents the OSC has a need for clear and unambiguous scientific advice. Such advice plays an important role in determining the nature of the response undertaken and may cause the type of response adopted to be

changed in response to changing circumstances during clean up (e.g. a change in wind direction which places different resources at risk).

For such advice to be effectively assimilated and used by the **OSC** requires clear lines of communication. The establishment of these can be facilitated by good personal rapport between the SSC and OSC and a mutual appreciation of the requirements and capabilities of personnel in each role. Participants agreed that this can be achieved by the development of an effective working relationship between key response personnel during response (as per Recommendation 1). It can be further augmented during training activities and assessed by auditing the effectiveness of each role after an incident. Participants therefore recommended that each SSC promote the importance of co-ordinated approaches to response and more fully define how the role of SSC can contribute to the co-ordination process (R.lO). To fully meet this requirement may also require a more "proactive" approach to involvement by designated SSCs, such as in the case of the 'Al Qurain" incident at Portland in 1988, where the Victorian SSC sought involvement in the response to a minor spill.

OSSM

During the simulation exercises and in general discussion about the role of SSC in providing advice to the OSC, it was agreed that a priority information need in any response will continue to be information. on the spill trajectory, such as is provided by OSSM. With the current upgrading of the OSSM package (Paper 17), and the development of new protocols for its access and use (via Federal Sea Safety Surveillance Centre) an OSC will have improved access to OSSM output. Nevertheless, it was felt by participants that an SSC could, and should, provide a screening service on this **output** to facilitate comprehension and evaluation by the OSC.

It was therefore recommended that SSCs develop familiarity with the use and application of the OSSM package (R.11). This could involve a number of activities, including:

* training in the use of OSSM, preferably during field-based and simulation exercises such as those conducted during OSC training courses;
* preparation of OSSM base maps (possibly linked with other coastal resources map files);
* development of competence in running OSSM-based simulations and interpreting output;
* verifying output and assessing model limitations based on the results of more detailed or better developed oceanographic models;
* "real time" assessment of the implications of changing meteorological and oceanographic conditions.

Monitoring

As is evident from Papers 16, 20 and 22; monitoring was an important item of discussion at the workshop. The current constraints on the availability of funds for monitoring during response has historically limited the use and application of monitoring in response. Participants agreed, however, that monitoring is an important element of any response. Monitoring provides for assessment of the impact of a spill, the efficacy of a clean up and the long term management needs of impacted areas. As noted in Paper 16, however, monitoring can only be effective (i.e. in meeting agreed objectives) if the monitoring strategy is prepared in advance of a spill and linked with other response activities.

It was therefore recommended that the SSCs clarify their potential use of monitoring in all phases of response and identify situations under which funds may be sought from the National Plan to support, or recover the costs of, monitoring activities (R.12). Once this is undertaken, State agencies will need to approach the Department of Transport and Communications with proposals for any recommended changes to National Plan arrangements to support agreed monitoring activities.

Media Relations

Oil spills are highly visible events. They may cause widespread alarm amongst the general public and are thus of considerable interest to the media. As noted in Paper 18, an SSC may play an important role in the way in which a spill is reported and hence perceived by the public at large. An SSC may also play an important part in the provision of information to the media on the environmental impact of a spill because of their expert knowledge in that field and the importance of environmental aspects to media interest. That role may impose requirements on the SSC additional to those envisaged in other areas of the response organisation.

During the workshop, emphasis was given to understanding the operation of the media and in training SSCs to be effective in media liaison. The output from both simulation exercises (Paper 21) was used to assess the media liaison skills of participants and was found to be a very useful exercise. It was therefore recommended that media relations be incorporated in any future SSC training, and that SSCs make provision for engagement in that role by identification with the OSC and Media Liaison Officer of appropriate preconditions for media liaison (R.13).

4. SSC Role in Follow-up

SSC Activities

During the workshop, it was suggested that to date most emphasis has been placed on the role of SSC

in the previous two phases (Preplanning and Response). It was recommended that SSCs now pay greater attention to the link between follow-up and preplanning by making provision for review activities which will enhance the overall response effort and ensure that the operational experience derived during an incident is integrated with planning for future response effort (R. 14).

As suggested in Paper 15, the follow-up phase of an oil spill is one in which the SSC may play an important role in a number of areas, including:

* monitoring (as discussed above);
* review of adequacy/efficacy of response (audit of effectiveness of scientific advice, and assessment of possible improvements in future incidents);
* identification of necessary revisions to contingency plan or procedural arrangements; and
* identification of further research and training needs in relation to issues or problems which arose during a response.

In each of these areas, the SSC is well placed to contribute as other members of the response team may not have the resources, time or expertise necessary to adequately undertake this review. Where possible, however, the SSC should involve other members of the response team in this process (additional to the usual debriefing) as it will play an important part in improving co-ordination and understanding of the needs of each team member.

Future training

Participants agreed that co-ordination and co-operation between designated SSCs will lead to a more effective response capability and therefore recommended that the Department of Transport and Communications make provision in future training activities for greater involvement of SSCs and for a further workshop specifically on the use of scientific advice in spill response in 1989/90 (R.15). The next SSC workshop should, if possible:

* involve the same SSCs who attended this workshop (for continuity and development of expertise);
* involve guest OSCs and provide for participation by guest speakers with expertise in the social and economic sciences (including fisheries personnel);
* provide for realistic, field-based training exercises - two suitable venues were suggested which provide suitable case study material and logistical support - Trial Bay (NSW) and Jervis Bay (NSW) - the latter is especially appropriate in view of the current proposals for naval base relocation and work in progress on environmental studies in that area;
* review progress towards implementation of the recommendations of this workshop and identify further research and training needs; and
* provide increased scope for small group discussions - this could be achieved by shorter lecture sessions (e.g. 40 min. max.) followed by discussion of lecture material.

5. Summary of Recommendations

No.	Details	Responsibility
1.	Develop rapport between key individuals involved in response and clear understanding of scientific input requirements.	all SSCs
2.	Seek support for an expanded program of coastal and offshore resources mapping and a uniform approach to G.I.S. preparation.	DoTC/GBRMPA/SSCs/ external funding agencies
3.	Circulate information on GBRMPA Macintosh-based mapping system and identify sources of support for upgrading of present systems.	DoTC/GBRMPA/SSCs
4.	Compile information on dispersant toxicity and prepare guidelines for dispersant use.	DoTC/GBRMPA
5.	Continue discussions with salvage operators and marine insurance underwriters to ensure mutual understanding of government/industry requirements.	DoTC
6.	Compile information on nature of threat from chemical spills.	all SSCs/DoTC
7.	Initiate the exchange of information within a 'network' of SSCs.	all SSCs/DoTC
8.	Prepare an SSC handbook (Operations Plan)	all SSCs/DoTC
9.	Prepare guidelines for land disposal of recovered oil as part of operations plans.	all SSCs
10.	Promote the importance of a co-ordinated approach to response and assess how an SSC can contribute to co-ordination process.	all SSCs
11.	Develop familiarity with the use and application of the OSSM package.	all SSCs

12.	Clarify potential use of monitoring in all phases of response and identify situations in which funds may be sought from National Plan to support, or recover costs of, monitoring activities.	all SSCs
13.	Incorporate media training in future SSC training, and identify appropriate preconditions for SSC media liaison.	all SSCs/DoTC
14.	Pay greater attention to link between follow-up and preplanning.	all SSCs/DoTC
15.	Make provision for SSC involvement in future training and for a further workshop on the use of scientific advice in spill response in 1989/90.	DoTC and others