

**ASPECTS OF SEA SAFETY IN THE FISHERIES
OF PACIFIC ISLAND COUNTRIES**



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ASPECTS OF SEA SAFETY IN THE FISHERIES OF PACIFIC ISLAND COUNTRIES

by

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PREPARATION OF THIS DOCUMENT

This publication is the report of a survey of fisheries-related sea safety in the Pacific Islands region undertaken by FAO in 2003. It is intended to assist in sensitizing fishery managers that sea safety is a legitimate and important objective of fisheries management, focus more attention on small fishing vessel safety and lead to improved systems for recording/analysing sea accident data and making use of the results. It will also serve as a discussion document at a meeting which is to be attended by motivated people from several relevant disciplines, focused on challenging issues, oriented to small fishing vessels, having the objective of producing results with a positive effect on regional and national sea safety programmes.

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ABSTRACT

In early 2003 FAO undertook a survey of fisheries-related sea safety in the Pacific Islands region. The objective of the work was to consolidate the experience gained by selected countries in safety at sea with the view of improving ongoing and future activities in the region.

The countries directly surveyed in the present study were Tuvalu, Tonga, Samoa, Fiji and Kiribati. Five main topics were covered: the relation of fisheries management to sea safety, safety programmes, data recording, legislation, and boat building and vessel design.

The major regional fisheries-oriented sea safety initiatives in the Pacific islands have been the 1991 FAO survey and the more recent work of the Secretariat of the Pacific Community (SPC).

The concept of including sea safety as a specific objective of fisheries management is not common in the countries covered by the survey. In several countries, safety appears to be considered when formulating management interventions, but the idea that saving lives of fishers could be one of the stated objectives of government management intervention does not occur in the five countries. To ensure that sea safety is included in fisheries management, a number of measures are suggested.

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1. Executive summary

1.1 The main finding

The survey	In early 2003 FAO undertook a survey of fisheries-related sea safety in the Pacific Islands region. The objective of the work was to consolidate the experience gained by selected countries in safety at sea with the view of improving ongoing and future activities in the region.
Survey coverage	The countries directly surveyed in the present study were Tuvalu, Tonga, Samoa, Fiji and Kiribati. Five main topics were covered: the relation of fisheries management to sea safety, safety programmes, data recording, legislation, and boatbuilding and vessel design.
Previous regional sea safety work	The major regional fisheries-oriented sea safety initiatives in the Pacific islands have been the 1991 FAO survey and the more recent work of the Secretariat of the Pacific Community (SPC).
Fisheries management and sea safety	The concept of including sea safety as a specific objective of fisheries management is not common in the countries covered by the survey. In several countries, safety appears to be considered when formulating management interventions, but the idea that saving lives of fishers could be one of the stated objectives of government management intervention does not occur in the five countries. To ensure that sea safety is included in fisheries management, a number of measures are suggested.
Past and on-going sea safety projects	<p>Sea safety initiatives which have been common in the past decade in the fisheries sector include:</p> <ul style="list-style-type: none">• Radio awareness programmes by various government agencies• Provision of subsidized safety gear, usually sponsored by donors• Revision of national shipping legislation to include fishing vessels• Institutional safety courses as required by revised legislation• Campaigns of enforcement of sea safety legislation• Sponsorship of vessel communication upgrades• The various components of the SPC regional safety awareness programme
Project successes	<p>The survey findings suggest that the following are generally successful at improving safety:</p> <ul style="list-style-type: none">• Appropriate small-vessel legislation backed up by “big stick” enforcement for urban-based commercial vessels• Radio programmes and extension visits for remote locations• Video for those communities with access to video facilities• “No survey, no licence” for areas/fleet strictly controlled by licensing• Institutional safety courses for the semi-industrial fleet
Project disappointments	<p>The results of some initiatives are disappointing:</p> <ul style="list-style-type: none">• The promotion of emergency sail rigs and auxiliary sail rigs in areas where there is no continuing tradition of sail use• Providing subsidies for safety gear without a long-term subsidy strategy• The sale of safety gear through government fishery agencies

Accident data recording	In most countries visited not much importance is attached to producing annual sea accident summaries with sufficient detail so as to be useful for sea safety programme planning. In Samoa where there is a relatively good system in place, the summary information on incidents of sea safety permits identification of accident-prone situations with respect to vessels, areas, and seasons.
Sea safety legislation	One of the major issues in national sea safety legislation is the coverage of small fishing boats. These are the vessels that are associated with most of the sea accidents in the region, but they are excluded from both the fisheries and shipping legislation in most countries.
Enforcement of sea safety legislation	Enforcement of legislation is a critically important issue in sea safety. The results of the survey suggest that for a country to be serious about improving the sea safety situation, that country must be serious about enforcing its legislation. This concept must be balanced with the reality that there are major enforcement problems in each country. There are, however, two schemes concerning enforcement that appear to work well.
Boatbuilding and vessel design	Rather than attempting to alter the evolution of vessel design in the region to improve safety, it may be more productive to “go with the flow” and promote safety features and construction standards for the types of vessels that are now popular and are likely to grow more common in the future. Safety aspects of fibreglass skiffs should not be ignored.
Political will	As a prerequisite to attracting more government attention for efforts to improve sea safety, it is recommended that additional attention be focused on keeping records of sea accidents and associated search/rescue expenses.
SPC sea safety awareness work	The success of past SPC awareness work together with the on-going requirements suggest that SPC efforts in this subject should continue with some modifications.
Regional sea safety workshop	A meeting which is attended by motivated people from several relevant disciplines, focused on challenging issues, oriented to small fishing vessels, and co-hosted by SPC could produce results having a positive effect on regional and national sea safety programmes.
Priorities for future sea safety work	<p>Within the scope of the topics covered in the present survey, the following areas appear to deserve priority:</p> <ul style="list-style-type: none"> • sensitizing fishery managers that sea safety is a legitimate and important objective of fisheries management; • focusing more attention on small fishing vessel safety; • improving systems for recording/analysing sea accident data and making use of the results; • awareness programmes; • a regional sea safety workshop.

1.2 Summary of the national sea safety issues and lessons-learned

Country	Issues in improving sea safety	Sea safety lessons-learned
Tuvalu	<p>Upgrading the recording and analysis of sea accident data; publicizing sea accident data</p> <p>Modifications to the Fisheries Act and Shipping Act to allow for coverage of the type of vessels commonly involved in sea safety incidents</p> <p>Formulation of a strategy which would result in offshore fishers carrying safety gear</p>	<p>Having offshore safety gear available is no guarantee that it will be used.</p> <p>Radio programmes on sea safety in the vernacular appear to have a major impact.</p> <p>Lack of recording, analysis, and publicity of sea accidents and government costs associated with these accidents, can lead to weak political will for sea safety improvements.</p> <p>Convincing fishers to change their habits may take considerable effort, as judged by a man who went on two long drifts before being convinced of the need for safety gear.</p>
Tonga	<p>The frequency and severity of sea safety problems is not widely appreciated in Tonga.</p> <p>Lack of enforcement of fisheries legislation for the smaller vessels</p> <p>Most fisheries officers, other government officials, and representatives of fishing companies support mandatory safety requirements, but there is considerable apathy on the part of small vessel operators</p>	<p>What is required to improve the safety of small fishing vessels is very different from that needed for the larger company-owned vessels.</p> <p>The best safety legislation is of limited value if not enforced.</p> <p>For a major improvement in safety on small boats, more is required than just programmes of awareness. Compulsory measures are needed but there does not appear to be the political will necessary to enforce such requirements.</p> <p>Without a good knowledge of the magnitude of sea safety problems in terms of number of incidents, lives lost, and cost to Tonga of search and rescue, it is easy to understand the lack of enthusiasm and political will for new sea safety initiatives.</p>
Samoa	<p>There is a large difference in safety issues between vessels based in the Apia urban area and those in remote locations</p> <p>The sea safety concerns of owners are very different from those of skippers/crew</p> <p>Balancing the need for safety training of vessel crew with the reality of large crew turnover</p>	<p>Mandatory requirements accompanied by a "big stick" approach to enforcement has worked best</p> <p>The analysis of past data on sea safety incidents can be very useful for future safety programmes</p> <p>There is a very big difference in attitudes between vessel owners and those that go to sea with respect to sea safety. To be effective, the penalties for non-compliance must cause substantial pain to the offending owners.</p> <p>There is a need to educate skippers and crew to refuse to depart for sea on an ill-equipped vessel</p>
Fiji	<p>Enforcement at sea of safety regulations</p> <p>Realistic sea safety regulations for small fishing boats</p> <p>Getting the awareness message to isolated villages</p>	<p>A major sea disaster may be required to generate political will to improve sea safety</p> <p>Radio appears to offer the greatest opportunity for sensitizing remote village to sea safety issues, and is certainly better than dependence on non-existent distribution channels of some of the government agencies involved in sea safety</p>

Country	Issues in improving sea safety	Sea safety lessons-learned
		As the use of fibreglass skiffs is likely to grow in Fiji and the region, more attention should be focused on appropriate construction standards
Kiribati	<p>Coverage of fishing vessels under seven metres by sea safety legislation, including provision for safety equipment, design criteria, and vessel inspection.</p> <p>Subsequent enforcement of any such legislation</p> <p>The need for an on-going safety awareness programme on every island</p>	<p>Most people who go missing are inexperienced with operation of vessels at sea.</p> <p>Full-time commercial fishers in Tarawa are becoming more aware of safety at sea.</p> <p>Emergency sail rigs will often be left at home if they have no other purpose than safety. If the sail can be used for sun and rain cover it will usually be carried, if the rudder and leeboard are a section of floor, they will usually be carried.</p> <p>Oars or spars must be useful in the fishing operation if they are to be carried.</p> <p>A small auxiliary engine will generally end up on another boat. A second engine is expensive, but because dirty fuel and running out of fuel are common, it is no guarantee of safety</p>

2. Introduction

2.1 Background

Sea safety and related issues are crucially important in Pacific islands fisheries. In some of the countries the accident rate for fishers is among the highest in the world. Over the last four decades various UN agencies, regional organizations, donor agencies and others have made efforts to address the situation. On the regional level, in 1991 FAO implemented one of the largest sea safety initiatives in the region – a survey of sea safety issues in 16 countries. This was followed by efforts of the Secretariat of the Pacific Community (SPC), especially in the area of sea safety awareness.

In early 2003 FAO undertook another survey of fisheries-related sea safety in the region. The objective of the work was to consolidate the experience gained by selected Pacific Island countries in safety at sea with the view of improving ongoing and future activities in the region. This report summarizes the finding of the survey.

Five major themes were covered in the survey. These topics and specific information to be collected on each topic are:

Fisheries management

- A detailed description of fisheries management in each selected country.
- A description of the effects of management developments on fishers' safety and accidents.
- Has sea safety been included in fisheries management initiatives? If so, how? If not, why not?
- What could be done to ensure that sea safety is included in fisheries management?

Safety programmes

- A description of the programmes that have been implemented since the last FAO study in 1991.
- What has been especially effective in these programmes?
- Which initiatives have had little or adverse effect on fisher's safety?
- What are the important areas for future interventions?

Data recording

- Which authority is responsible for data recording, analysis and feedback in the different countries?
- How is data on accidents gathered, analysed and presented?
- What is done with the data generated, are there follow-up activities?
- Based on the above, how could data collection and analysis be improved?
- What conclusions can be drawn from the existing data?
- A presentation of existing data, for the last ten years, on accidents related to fishing operations from the different countries

Legislation

- A description of the present legislation for safety on fishing boats and for fishing operations in the different countries.
- A description of existing regional legislation and agreements regarding safety at sea.
- Which authorities are responsible for the legislation related to safety for fishing boats and fishing operations?
- Which authorities are responsible for inspection of fishing vessels?
- Is the existing legislation enforced?
- Based on the above, how could legislation and enforcement of legislation be improved?

Boatbuilding and vessel design

- A description of past and ongoing initiatives related to fishing vessel design.
- How have these initiatives affected the safety of fishing vessels?
- Are safety issues being addressed in the vessels constructed in the region?
- Are there any successes in the attempts to promote the use of sail?
- Is there a need for future vessel design work in regards to safety, and if so, in what areas?
- Is there a role for FAO in the interface between naval architecture and safety?

2.2 Survey and report considerations

Ideally, a study sea safety in the Pacific islands would entail visits to each country. Unfortunately, funding and time constraints dictated that, unlike the 1991 FAO survey, only five countries would be directly surveyed in the present study: Tuvalu, Tonga, Samoa, Fiji, and Kiribati¹. It was the intention that by surveying a selection of five countries from Melanesia, Polynesia, and Micronesia, including both atoll and high island countries, many of the important sea safety issues and recent developments in the region would be covered.

Not all aspects of sea safety in the region were covered in the survey. The information collected was largely restricted to the five topics detailed in Section 2.1 above. As such, other important topics such as causes of accidents, search/rescue, and survival at sea were not addressed. The scope of vessels covered was restricted to locally-based fishing boats of up to about 20 metres in length.

The term "safety" requires clarification. As with the earlier FAO study (McCoy 1991), "safety" is associated with the ability of a vessel to return to port (or more usually the island or village) at the

¹ As the information collected and thoughts on safety evolved while the survey proceeded, the countries appear in this report in the order which they were visited.

completion of a voyage or trip. Other aspects of safety in fishing such as accidents with gear or in fish handling, dealing with illness on board, collisions at sea, and SCUBA are not addressed in this report.

Two consultants were recruited for the survey. One of the consultants, Mike Savins, was responsible for collecting, analysing, and presenting the information related to Kiribati. The other consultant was responsible for the other four countries and writing up the material.

The survey commenced on 20 January 2003. Between that date and 23 February five countries were visited and 71 individuals were interviewed from government agencies, regional organizations, fishing companies, boatbuilding operations, and fishing vessels. These people and their institutional affiliations are given in the Appendix.

2.3 The Pacific Islands region

Recognizing that some of the audience for this report may have limited knowledge of the Pacific islands, information on the region and features important for sea safety is provided here.

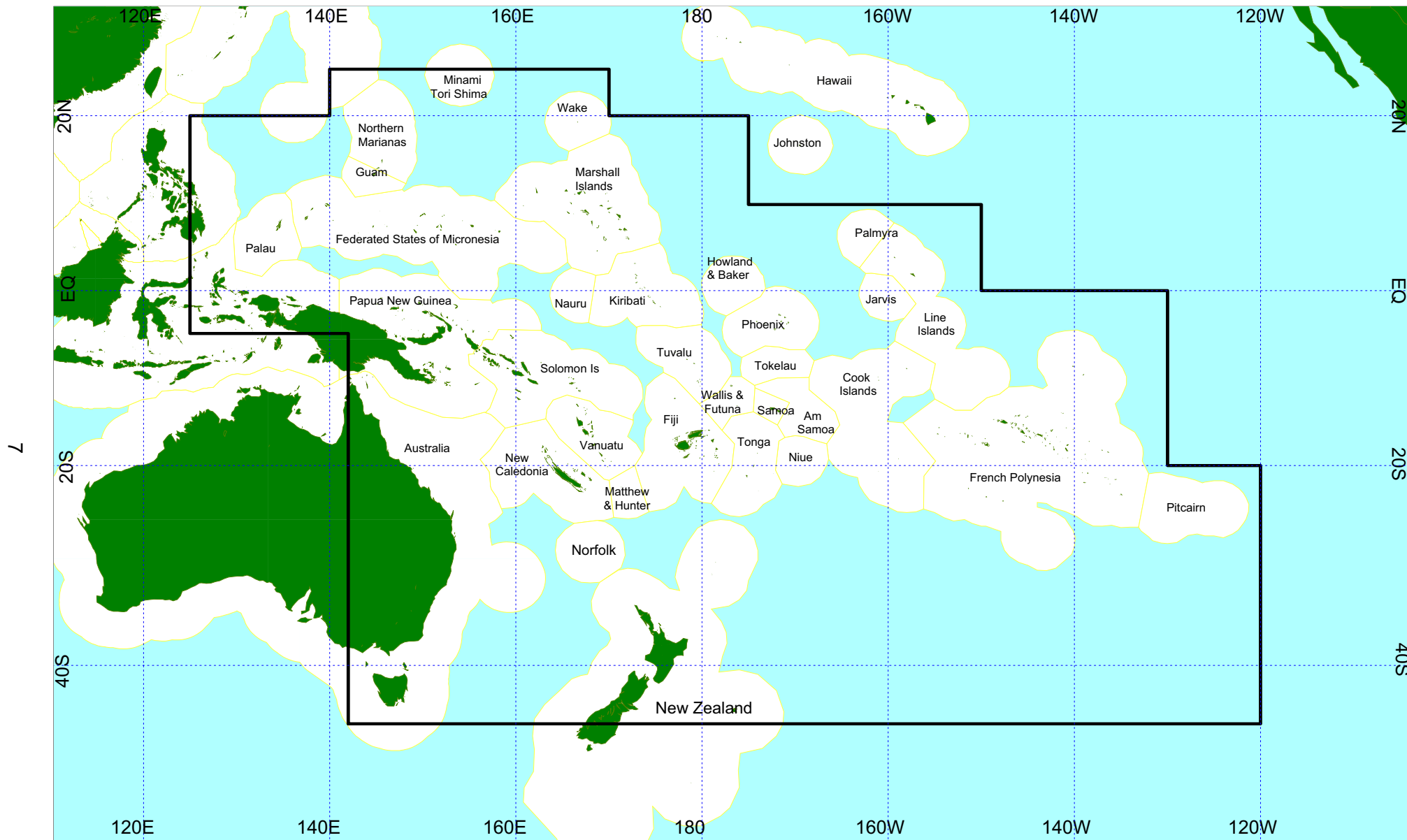
In reference to the fisheries of the Pacific islands, there is often uncertainty over the geographical area in question. In roughly descending size, the western and central Pacific Ocean (WCPO), the US South Pacific Tuna Treaty area, Secretariat of the Pacific Community statistical area (Figure 1), FAO statistical area 71, SPC area, and the EEZs of Pacific Island FFA-member countries are used to describe the “region”. Unless otherwise stated, the term “Pacific Islands region” referred to in this report is that of the 200-mile zones of Pacific Island countries. The term “Pacific Island countries” is used here to refer to the 14 independent Pacific Island nations.

The political entities of the Pacific islands are characterized by large exclusive economic zones (EEZs) and, in the main, very small land areas. The total area of the region’s EEZs is estimated to be 30 569 000 km², equivalent to about 28 percent of the world’s EEZ area. The land area is 552 789 km², of which 461 690 km² (84 percent) is in Papua New Guinea.

In general, the islands increase in size from east to west. Most islands rise steeply from the deep ocean floor and have very little underwater shelf area. Coral reefs characteristically surround the islands, either close to the shore (fringing reef) or further offshore (barrier reef), in which case a coastal lagoon is enclosed. The area includes many atolls, which are the remnant barrier reefs of islands that have subsided. Some of the more recent islands in the area lack coral reefs.

Some distinctive features of the region that are important for sea safety include:

- mainly small-scale fishing in inshore/coastal areas and larger scale tuna fishing offshore;
- the use of fish aggregation devices (FADs) to facilitate the access by small-scale fishers to tuna resources;
- occurrence of destructive cyclones, mainly during the seasons of maximum oceanic wartonnesh;
- the presence of communities in most countries that may have only limited contact with urban areas;
- Australian-funded patrol boats and maritime surveillance advisors in most countries;
- significant amount of inter-island transport on small boats, many of which also serve as fishing vessels;
- lingering tradition of the use of sail in the remote areas of about half of the countries;
- a large number of foreign tuna fishing vessel operating in the offshore areas;
- the existence of maritime or fisheries academies in several countries;
- the number of seafarers and mariners familiar with the sea is a high percentage of population relative to larger nations.



Map courtesy of SPC

Figure 1: Secretariat of the Pacific Community (SPC) Statistical Area

Also worth mentioning is the close-knit nature of Pacific Island communities. Unlike some of the larger nations addressed by major sea safety programmes, most people in the governments and administrations of Pacific Island countries have friends/relatives working in the fishing industry, or may be part-time commercial fishers themselves. As an example, in one country the Secretary of Foreign Affairs was involved in a sea safety incident which involved drifting for several days. The close-knit nature of Pacific Island countries also has significant implications for enforcement of safety legislation.

Fisheries cooperation, fostered by the regional organizations, is another prominent feature of the Pacific islands. The region has two organizations with major involvement in fisheries matters and several others with peripheral involvement:

- The Secretariat of the Pacific Community (SPC) headquartered in Noumea, New Caledonia has a fisheries programme which is primarily concerned with scientific research on the tuna fisheries and with research, development, and management of the coastal fisheries for the 22 countries and territories in the Pacific islands.
- The Forum Fisheries Agency (FFA) headquartered in Honiara, Solomon Islands is concerned primarily with economic, policy, and management aspects of the offshore tuna fisheries in the 14 independent Pacific Island countries plus Australia and New Zealand.

The table below gives information on vessel numbers in the region.

Estimates of fishing vessel numbers

	Locally-based tuna vessels (Gillett, 2003)	Motorized artisanal fishing vessels (McCoy 1991)	Non-motorized artisanal fishing vessels (McCoy 1991)	Other information on vessel numbers (from Gillett 2002 or this report)
Cook Islands	10 L/L	200	120	1996 census indicated a total of 1 291 fishing boats, of which 26% were located on Rarotonga
Fiji	96 L/L 1 P/L	1 600	400	See Section 8.1 of this report
FSM	34 L/L 8 P/S	2 000	600	
Kiribati	2 L/L 1 P/S	600	5 000	See Section 9.1 of this report
Marshall Islands	54 L/L 5 P/S	500	250	
Nauru	1 L/L	100	80	A 1992 survey recorded 218 powered skiffs and 128 paddling canoes
Niue	100 skiffs	60	240	In June 2001 Niue had 62 registered boats and about 200 canoes
Palau	71 L/L 1 P/L	700	40	At least 25 percent of households own fishing boats
PNG	40 L/L 24 P/S	8 000	10 000	
Samoa	153 L/L	80	100	See Section 7.1 of this report
Solomon Islands	12 P/L 2 P/S 8 L/L	1 800	5 000	
Tonga	26 L/L	800	200	See Section 6.1 of this report
Tuvalu	20 skiffs	200	500	See section 5.1 of this report
Vanuatu	10 skiffs	250	2 000	Fisheries officials indicate that there are between five and ten full-time and five to ten part-time skiff trolling operations
Total ²	14 P/L 40 P/S 495 L/L	16 890	24 530	

P/L = Pole and line vessel; P/S = Purse seiner; L/L = Longliner

² The total does not include skiffs - the number of skiffs was only noted in countries where industrial tuna vessels are absent.

3. Regional fisheries-oriented sea safety initiatives

The major regional fisheries-oriented sea safety initiatives in the Pacific islands have been the 1991 FAO survey and the more recent work of the Secretariat of the Pacific Community (SPC). As background for the present study, descriptions of these projects are given in sections 3.1 and 3.2 below.

3.1 The 1991 FAO survey of safety at sea in Pacific islands fisheries

FAO sponsored a consultant, Mike McCoy, to undertake a survey of safety at sea issues in Pacific Island artisanal fisheries in early 1991. The project surveyed 16 countries and island territories with the objectives of determining the types and magnitude of safety problems confronting small-scale artisanal fishers in the Pacific region, to catalogue current programmes or projects which directly address this issue and to draw conclusions based on the information collected. That work represents one of the few attempts to examine fisheries-related sea safety in the Pacific islands on a regional basis.

Because the report of the survey (McCoy, 1991) still has considerable relevance to the sea safety situation today, a summary of the findings is given below.

The study indicated that most international conventions dealing with safety were found to omit vessels of the size used in artisanal fisheries in the Pacific. After visits to the countries and territories and interviewing 169 fishers and government officials, it was found that most countries do not provide for safety legislation to cover smaller boats or canoes, and officials generally believe that it would be impossible to enforce such regulations if they were introduced.

It was estimated that there were about 25 000 non-motorized and 16 000 motorized artisanal fishing vessels in the region, and that an average of one incident of distress per day comes to the attention of officials concerned with search and rescue. Because of problems of communication and the remoteness of many islands and villages, this probably underestimates the total number of actual incidents. Likewise, the known fatalities attributed to these incidents, about 60 per year, are probably far less than the actual total. It is also recognized that many of these vessels are used for a variety of purposes, and that distress is not always encountered solely during fishing activities.

Practical problems, including poor engine maintenance, limited availability of spare parts, and high cost of life-saving aids are also taken into consideration. It was found that the total of all budget allocations by the island countries for local search and rescue activities amounts to about US\$100 000 yearly. However the actual cost of such activities is probably in the range of US\$750 000 to US\$1 000 000 *per annum* for the region as a whole.

Many officials in the countries surveyed believe that the public (including artisanal fishers themselves) does not recognize there to be much of a problem with safety on small boats. Many people interviewed, all of whom are associated with fisheries, safety, or search and rescue, offered a variety of suggestions on how to improve safety practices, thereby lowering the number of accidents. Professional mariners were almost unanimous in recommending increased public awareness through educational programmes and publicity as being the one means most likely to produce the desired results.

With respect to future initiatives to improve sea safety, the following thoughts were offered:

- Financially it does not appear that many countries are in a position to significantly increase their activities relating to safety at sea. However there are areas such as communications where advances or improvements that might take place independent of safety considerations would have a positive effect.

- In planning even modest programmes it must be realized that safety at sea is something which must be taught and continually reinforced. It is recognized that heightened awareness of safety in industrial societies is due to constant reinforcement. In the island countries, it is the almost total lack of exposure to safety awareness on a recurring basis that results in it being ignored. Programmes should thus emphasize the necessity for their continued, long-term existence.
- There should also be an increase in the availability of safety equipment, spare parts and training; but the experience of countries surveyed shows that these three items in themselves will not provide the desired results.
- Sources of funding can sometimes more easily be arranged for programmes emphasizing education than for acquisition of equipment. In the fisheries sector there are several agencies that have been interested in supporting education, training, and transfer of technology, all of which broadly cover the areas noted. In considering what types of activities are most appropriate, it should be kept in mind that each country possesses a unique set of circumstances surrounding safety at sea and programmes must be specifically tailored to each. For the funding of future activities to become a reality, the impetus must come from the countries themselves.

The major conclusion of the study was that education through publicity campaigns, repeated and reinforced over a long period of time and backed up by a good supply of equipment and spare parts, and training seems to offer the best chance for improving safety at sea for artisanal fishers.

3.2 Secretariat of the Pacific Community sea safety work

Regional fisheries-oriented sea safety initiatives have also been undertaken by the Secretariat of the Pacific Community (SPC). That work is mostly associated with the Coastal Fisheries Programme (based in Noumea), and to a lesser extent, the Regional Maritime Programme (based in Suva).

The Fisheries Training Section of SPC's Coastal Fisheries Programme has been especially active in the areas of sea safety awareness and statutory training relating to sea safety. Some comments on the effectiveness of the awareness work are given in Section 11.2 of this report. Safety resource materials available at the Fisheries Training Section include:

- Safety Aboard Fishing Vessels (a practical guide for crew members)
- FAD Fishing Skills Workshop, Teaching Modules, Module 2: Safety at Sea and Small Boat FAD
- Four safety at sea posters
- Logo Stickers "Think Safety at Sea"
- A4-size stickers "Small Boat Safety Check-list"



The SPC sea safety logo

- Laminated cards "Small Boat Safety Check-List: Five Minutes Which Can Save Your Life"
- Three videos "Better Safe than Sorry", "Survival at Sea", "Rambo Goes Deep-sea"
- Eight TV clips "Boat Safety Tips"
- Audio-tape programme on Safety at Sea (radio)
- Training materials, including (a) Teaching Resource Package for the Pacific Island Qualified Fishing Deckhand, (b) Basic Sea Safety Certificate course (Learner's Guide, Trainer's Guide, Overhead Transparencies), and (c) Kit of teaching materials for a two-week Pre-Sea Safety and Fishing course (screening of potential crew of longliners and purse-seiners)

Other safety work of the Coastal Fisheries Programme is the safety advocacy of the masterfishers during country visits (e.g. refusing to go to sea on unsafe fishing vessels), safety recommendations in reports of the Fisheries Development Section, and articles in the SPC Fisheries Newsletter.

The SPC Regional Maritime Programme is primarily focused on shipping legislation and provision of maritime training. The programme's fisheries-oriented sea safety initiatives consist of preparation of generic legislation for "non-convention vessels", organizing meetings of the Association of Pacific Islands Maritime Training Institutions and Maritime Authorities (APIMTIMA) which occasionally cover fisheries subjects³, production of some small vessel safety awareness material, and preparation of materials containing safety topics for statutory courses.

4. Country information

In sections 5 to 9 below aspects of sea safety in Tuvalu, Tonga, Samoa, Fiji, and Kiribati are examined. As the information collected and thoughts on safety evolved as the study proceeded, these country sections appear in the order in which the countries were visited. A summary of the major issues and lessons-learned in each country is given in Section 1.

Much of general information in these country sections is from Gillett (2002) and from other work done for FAO and other agencies by the consultant.

5. Sea safety in Tuvalu

5.1 General

The islands of Tuvalu are all low lying atolls. From north to south they are Nanumea, Nanumanga, Niutao, Nui, Vaitupu, Nukufetau, Funafuti (the main urban area and government administrative centre), Nukulaelae and Niulakita. Tuvalu's small land area of only 26 km² is tiny when compared to its EEZ area, which covers 900 000 km².

A recent FFA study indicated that ten to 20 vessels on Funafuti fish commercially and mainly for tuna. Another ten commercial boats fish frequently for tuna. Alternatively, the head of the Funafuti Fishermen's Association indicated that there are about ten boats which could be considered full-time commercial tuna boats. A survey by the Fisheries Department in 2000 showed 125 boats and 104 canoes on Funafuti. No privately-owned vessel on Funafuti is greater than seven metres and most are less than six metres.

There is little data on vessels in the outer islands. The 1991 census gave information on household ownership of motorized vessels which ranged from two percent on Nui to 53 percent on Nukulaelae. McCoy (1991) estimated that in the whole country there were 200 motorized small fishing and 500 non-motorized canoes.

A study by the Tuvalu Economic Research and Policy Division (ERPD, 2000) gave the major causes of loss of life on fishing vessels as bad weather, loss of power, and alcohol. The study also commented that "search and rescue (SAR) operations are inefficient and ineffective in the country".

5.2 Fisheries management and sea safety

Government interventions in the fisheries sector are largely limited to action for obtaining government revenue from the foreign offshore fisheries and to small-scale inshore fisheries development. According to the Director of Fisheries, there are no conventional fisheries

³ One of the best summaries of SAR operations in Tonga is appended to an APIMTIMA report.

management measures in place at the moment⁴. The Tuvalu section of the FFA Regional Compendium of Fisheries Legislation Western Pacific Edition, 1999 states: "Apart from conditions relating to the licensing of foreign fishing vessels, there is very little regulation of fisheries in Tuvalu. In earlier times there were well developed systems of traditional resource management but many of these appear to have broken down."

Fisheries management measures have therefore not had much effect on the sea safety situation in Tuvalu. The possible exceptions to this are:

- The absence of management measures focused on preventing over-exploitation of inshore fisheries may have led to resource decline and indirectly promoted more offshore tuna trolling, the fishery that causes most sea safety problems.
- One of the objectives of fisheries management in Tuvalu is to maximize the generation of government revenue by licensing foreign fishing vessels. The resulting large number of foreign vessels in the Tuvalu EEZ may create conditions favourable for the recovery of Tuvalu fishing vessels in distress.

Sea safety has only been included in fisheries management measures in a limited manner. Although no relevant management measures are in place at present, the government has recently focused considerable effort on formulating the Tuvalu National Tuna Development and Management Plan. Two provisions in the Plan have an effect on safety:

- One of the six development strategies of the Plan is "enhancing the skills of Tuvaluans in tuna fisheries, including sea safety certificate training for all skippers, crew and with the programme being extended to other Tuvaluans fishing outside the reef."
- One of the initiatives to promote domestic tuna development is through "Small Boat Regulation – a working group is to be established to develop small boat Regulations covering especially the carrying of appropriate sea safety equipment."

According to Fisheries Department officials, the reason that sea safety has not been included in fisheries management measures is because of priorities of the department, lack of capacity, and the fact that the present fisheries legislation does not allow the regulation of the size of vessel commonly used for offshore fishing.

It appears that several measures could be taken to encourage the concept of including sea safety in fisheries management. A fundamental prerequisite is that the Fisheries Act be modified so that it encompasses the types of vessels commonly used for offshore fishing. Political will must be generated to promote/approve changes to the legislation. Mechanisms to do so include: (a) calculation of the cost to the government of search and rescue operations, (b) determining the number of lives lost in sea accidents in recent years in Tuvalu, and (c) publicity of the results of (a) and (b). The Fisheries Department would appreciate suggestions and examples of the inclusion of sea safety in fisheries management.

5.3 Safety programmes

Sea safety programmes that have been implemented in the last decade in Tuvalu include:

- Craft testing programme (late 1980s to early 1990s): several fishing vessels were constructed and tested. One of the objectives was to promote the use of safer vessels, including the use of emergency sail rigs. The programme did not result in fishers using safer vessels or carrying emergency rigs.
- Radio awareness programme (mid-1990s): using SPC technical material, a series of radio programmes were broadcast over the national radio station. Most people in Tuvalu seem to recall the programme and many fishers feel that it was effective in causing them to think about safety issues.
- Provision of flares (mid-1990s): the Fisheries Department provided a total of about 20 sets of flares free of charge to selected fishers. There was a requirement that the flares used be

⁴ Some sources indicate that the island Councils in Tuvalu have some rules which relate to fisheries management. It is not clear whether any council's rules affect the sea safety situation.

replaced at cost by the user. Fisheries Department officials are unsure if any of the flares were used in actual distress incidents. Some fishers feel that it encouraged the use of flares, or at least publicized the value of flares.

- SPC awareness materials (mid-1990s and continuing): SPC has furnished free-of-charge to Tuvalu brochures, posters, stickers, and videos. The effectiveness is difficult to gauge, but the poster seems to be the most prevalent, at least in government offices. Fishers interviewed did not recall seeing the video.
- Canada Fund project on sea safety training for Nukulaelae Atoll (just approved, not yet commenced): A\$12 000 is now available for the training of people from this atoll in the use of flares, radios, charts, and general safety. This is to be followed by the Island Council managing a scheme for the hire of such safety gear.
- Although not strictly a “programme”, the arrival of the Australian-funded patrol boat, *Te Mataili*, in 1994 affected the sea safety situation. According to the Maritime Surveillance Advisor, the patrol vessel in the last two years participated in two operations searching for missing fishers.

Determining the relative effectiveness of the above programmes is difficult. Most Tuvaluans seem to be aware and familiar with the radio sea safety programme. The fact that it was in the vernacular may have contributed to its recognition. Few people outside of the Fisheries Department appear to remember the craft testing programme. An emergency sail rig donated to a fisher was rarely, if ever, used. One fisher interviewed now carries flares because of the Fisheries Department’s flare scheme. No safety initiatives appear to have had a negative effect on the safety of fishers.

There appears to be a consensus among Fisheries Department staff, other government officials, and fishers that improvements in sea safety in Tuvalu will revolve around the offshore troll vessels carrying safety gear. It also seems that there is general agreement that mandatory legal requirements are appropriate. Most of the debate is focused on how the costs of safety gear should be accommodated. “Fishermen cannot afford the gear” is often heard in this context. Various schemes have been proposed. One is a fund for the purchase of several safety kits (including VHF radio and spare outboard engine) for 115 boats at a total cost of A\$389 275. Boat operators would purchase the gear using an interest-free loan from the fund. Another proposal is for the government to subsidize a portion of the cost of safety gear. One idea is for the Fisheries Department or island councils to hire out safety kits. No mention was made of the concept that safety gear is a business cost of operating a vessel offshore and that the selling cost of fish should reflect this expense.

If it is accepted that carrying safety gear is the most appropriate measure for improving sea safety, the main areas for future interventions are:

- Making important safety gear available in Tuvalu
- Drafting the required changes to legislation to enable mandatory requirements for safety gear
- Facilitating the acquisition and use of the required gear by offshore fishing vessel operators
- Promulgation of safety gear requirements

5.4 Data recording

Incidents concerning sea safety in Tuvalu are reported to the Police Department and are recorded along with all other complaints received. At the end of each year the complaints are categorized and the items in each category are summed up for the Police Department’s annual report. According to the Acting Superintendent of Police, there are no categories dealing with sea safety and therefore the annual compilation does not provide information on such incidents.

Another source of information on sea safety incidents is the logbook on the government patrol vessel, *Te Mataili*. According to the Maritime Surveillance Advisor, prior to 2001 the logbook was not diligently maintained and cannot be relied upon for sea safety incidents. An examination of *Te Mataili* logbook entries for 2001 and 2002 shows two cases of the patrol vessel being used for search and rescue. Details are available for one of these: In May 2002 three people drifted away

from Funafuti. The *Te Mataili* logbook indicates that the subsequent search by the patrol vessel, the Tuvalu passenger/cargo vessel, and New Zealand aircraft was unsuccessful.

Fisheries officials indicate that in the 2001/2002 period there was one serious incident in which the patrol vessel was not involved as the vessel was not in Tuvalu. In September 2001 two boys drifted away from Funafuti while fishing. One was recovered 18 hours later but as he suffers from mental problems, he has not provided useful information. The other boy and the boat were never found.

In summary, the quality of the readily available data on sea safety incidents is not high. Even for the most recent two-year period, all that can be easily concluded is that there were probably three serious incidents and at least one life was lost⁵.

Improvements to the existing readily-accessible data would not be difficult to make. Police complaint records should include a specific category for incidents of sea safety. It is understood that staff of the patrol vessel have recently begun dedicating more effort to logbook entries.

5.5 Sea safety legislation

Sea safety could conceivably be covered under two laws, the Shipping Act and the Fisheries Act. There are difficulties, however, in both acts with the coverage of the type of vessels often involved with sea safety problems.

The Shipping Act applies to several categories of vessels, but the type of vessel which commonly trolls for tuna outside the lagoon does not seem to be addressed. Ten categories of vessels are recognized under three general types: (1) lagoon service vessels, (2) inter-island vessels, and (3) foreign going vessels. Vessels fishing outside the lagoon but not involved in inter-island trips do not appear to be covered by the Act.

There is a major problem associated with coverage of sea safety by the Fisheries Act. The Act states that paddling canoes, boats, punts and barges under seven metres in length are not regarded as “fishing vessels” and are thereby excluded from regulation⁶. As there are no privately owned fishing vessels in Tuvalu over seven metres, the Act does not apply to any of the commercial boats now operating in Tuvalu.

Both the Shipping Act and the Fisheries Act require simple amending in order to allow coverage of the type of vessels commonly used for offshore tuna trolling. In addition, there are advantages of including a specific provision in the Fisheries Act for the Minister to make regulations concerning sea safety. Presently the Minister has power to make regulations concerning 16 named topics, including inspection of vessels, but the purpose of the inspection is not stated.

5.6 Boatbuilding and vessel design

There has been a limited amount of fishing vessel design work specifically for Tuvalu:

- In the early 1980s Save the Children Foundation commissioned a US-based naval architect to produce designs for sailing/fishing multi-hull craft for Tuvalu, including a 7.3 metre catamaran and a 4.7 metres paddling canoe. A few of the larger craft were built in the Foundation’s Funafuti boatyard but did not result in the design being adopted by local boatbuilders and fishers. According to Gulbrandson and Savins (1987) about 100 of the paddling canoes were built for the outer islands in Tuvalu.
- The manager of one of the three boatyards in Funafuti (former employee of the Save the Children boatyard) stated he has modified the design of an 18 ft plywood outboard skiff for local conditions: a flat bottom for lagoon use and a V-bottom for trolling in the ocean. He is

⁵ Fishermen interviewed in Funafuti during the present study indicate that three Tuvalu fishermen drifting at sea for two months were picked up by a Korean fishing vessel in mid-2002. It is not clear if these men were the object of the May 2002 search.

⁶ In the compendium of fisheries legislation prepared by the Forum Fisheries Agency there is a typographical error in the Tuvalu Fisheries Act which results in the Act erroneously applying to vessels less than seven metres.

not aware of anyone in Tuvalu building any fishing craft other than the traditional canoes and skiffs to be powered by outboards.

According to the above boatyard manager and other sources in Tuvalu, there have been few, if any, cases of the plywood skiffs breaking up at sea. He states that, if swamped, the plywood skiffs with 40 hp engine will float bow-up in the ocean, however the boats do not paddle well.

FAO sponsored the visit of a sailmaker to Funafuti in the late 1980s. In the early 1990s an FAO consultant boatbuilder demonstrated the construction and use of an emergency sail rig. One fisher indicated that such a rig was donated to somebody in Tuvalu but it was rarely or never carried on fishing trips.

Although there is a lingering heritage of the use of sail on canoes in the outer islands of Tuvalu, the attempts to re-introduce the use of sail by Save the Children, FAO, and other agencies have not had much impact. The activity that causes most loss of life at sea, offshore tuna trolling, is one of the more difficult fisheries for the use of sail. Even during traditional times, tuna trolling was done from paddled canoes (Kennedy, 1930). Considering the conditions in Tuvalu, any potential for sail appears to be for emergency propulsion.

5.7 Observations

The major issues in improving sea safety in Tuvalu appear to be:

- Upgrading the recording and analysis of sea accident data; publicizing sea accident data.
- Modifications to the Fisheries Act and Shipping Act to allow for coverage of the type of vessels commonly involved in sea safety incidents.
- Formulation of a strategy which would result in offshore fishers carrying safety gear.

Some sea safety lessons-learned in Tuvalu:

- Having offshore safety gear available is no guarantee that it will be used.
- Radio programmes on sea safety in the vernacular appear to have a major impact.
- Lack of recording, analysis, and publicity of sea accidents and government costs associated with these accidents, can lead to weak political will for sea safety improvements.
- Convincing fishers to change their habits may take considerable effort. One Tuvalu man was involved in a mishap in December 1995 and drifted for 25 days. He was involved in a very similar situation 13 months later and drifted for another 25 days. He now is an advocate of mandatory safety gear requirements.

6. Sea safety in Tonga

6.1 General

Tonga is made up of approximately 150 islands, of which about 36 are inhabited. The islands are distributed in three main groups - Tongatapu (location of the capital and administrative centre, Nuku'alofa) and neighbouring islands in the south, the Ha'apai group located centrally, and the Vava'u group to the north. Other islands extend the archipelago further north and south beyond the three main groups.

In early 2003 the local fishing fleet consisted of:

- about 26 locally-based longline tuna vessels from ten metres to 25 metres all of which are based in Nuku'alofa;
- about 16 snapper/bottomfish vessels from 8.5 to 12 metres, most of which are based in Nuku'alofa with a few in Vava'u;
- several hundred boats under 8.5 metres. The Ministry of Fisheries estimates from 20 to 50 boats under six metres around Tongatapu, but no such estimate is available for other areas of the country. Most of these small craft remain in inshore areas, but offshore trolling for

tuna in small boats is well-established practice in some fishing communities throughout the Tonga group, notably on 'Eua, 'Atata, Euaiki, 'Uiha and Ofolaga;

- a few dozen pleasure fishing vessels and a small number of commercial gamefishing vessels, most of which are based in Nuku'alofa with a few in Vava'u and Ha'apai.

According to staff of the Ministry of Fisheries and commercial fishing companies, the major causes of sea safety incidents are outboard engine mechanical problems, battery problems for craft powered by inboard engines, and sudden deterioration of weather conditions. The snapper fishery, in which the mainly small participating boats have moved progressively further offshore over the last two decades (some are now fishing over 100 nautical miles offshore), causes many of the major sea safety problems.

The geography and climate of the area has a large impact on sea safety. Fiji's Lau Group to the west consists of almost a hundred islands and reefs sprinkled in a north/south line about half the distance between Tonga and Fiji's main island of Viti Levu. From north to south the Lau Islands stretch over 250 nautical miles and the distance between the islands is usually less than 20 miles. This geography and the prevailing winds from the east causes the Lau Group to form a net and the majority of vessels drifting away from Tongatapu, Ha'apai, and Vava'u eventually end up in Lau.

6.2 Fisheries management and sea safety

Government management interventions in the fisheries sector can be categorized by fishery resource: tuna, snapper/bottomfish, and inshore resources.

The management of the tuna fisheries in Tonga is specified in the Tonga National Tuna Management and Development Plan. According to the Plan, the objectives of management of the Tonga's tuna fishery are to: (a) ensure that the utilisation of Tonga's national tuna resource is compatible with the sustainable harvesting of the tuna stocks throughout their range; (b) maximize economic benefits to Tonga from the utilization of its tuna resources, including harvesting and processing; and (c) contribute to the food security of Tongan subjects and, through the sustainable utilisation of the tuna stocks, the global community. The primary management tool is a limit on the licensing of vessels over 13 metres in length, which is currently set at 50 vessels. Sea safety has been incorporated into the management plans to the extent that there are three provisions addressing safety:

- Every vessel licensed for tuna fishing, including foreign fishing vessels, must hold either a valid safety certificate issued by the Ministry of Marine and Ports or else a temporary exemption from this requirement pending the vessel's arrival in a Tongan port for inspection.
- The operator of a licensed vessel must ensure continuous monitoring on board of the international distress and calling frequency and the international safety and calling frequency to facilitate communication with the fisheries management, surveillance and enforcement authorities.
- Aerial and surface patrol assets will be strategically deployed to assist in the monitoring and surveillance of the tuna fishery. Such activities are aimed at, among other things, increasing the safety of the fishing industry through effective search and rescue activities.

The arrangements for the management of the fishery for deepwater snapper and other bottomfish are presently being formalized in a fisheries management plan. In the past there were informal arrangements for management, including some notions of objectives. The de-facto fishery management objective of protecting the resources from over-exploitation, was apparently achieved by the economics of the fishery (i.e. when there were too many vessels fishing, profitability was low, some vessels dropped out of the fishery, and the stock was able to recover to some extent). With the assistance of SPC and the Tonga AusAID Fisheries Project, the Ministry of Fisheries is in the process of producing a management plan for the fishery as required under the Fisheries Act

1989⁷. According to officials of the Ministry of Fisheries, sea safety has not received special attention in the management plans presently being formulated. The major safety issue associated with management of the fishery is that resource depletion on the nearby seamounts, possibly due to past management deficiencies, causes the boats to venture far offshore.

The management of Tonga's inshore fisheries is complex. According to the 1998 FAO/AusAID Fisheries Sector Review (Gillett *et al.*, 1998), increased fishing pressure driven by improved access to markets, rising prices, and population growth is resulting in marked declines in important inshore marine resources. Unlike the situation in other Pacific Island countries, coastal communities in Tonga have no preferential access to adjacent resources. This open-access situation may have worked reasonably well in the era of subsistence fisheries, but it has recently collided with commercial realities and the carrying capacity of inshore resources. The Ministry's management interventions in inshore fisheries appear to fall into two categories: (1) Implementation of the provisions of the Fisheries (Conservation and Management) Regulations 1993 (e.g lobster size limits) and (2) bold action in support of fisheries which have collapsed (eg. banning the export of giant clams in 1994, banning the export of bêche de mer in 1997). Enforcement of legislation is reported to be weak. Sea safety is not a major consideration in the inshore management arrangements. The main sea safety issues in the inshore fisheries⁸ are that in the Ha'apai Group, inshore fishing can involve trips between islands and both mechanical breakdowns and swampings occasionally occur. In Tongatapu and Vava'u, however, the barrier reefs offer some degree of protection.

Fisheries management officials at the Ministry of Fisheries are not familiar with the concept of including sea safety in fisheries management initiatives, but there seems to be willingness to do so. It presently appears to be a situation of the Ministry focusing on the basics of resource management.

With respect to ensuring that sea safety is included in fisheries management for the future, the two major possibilities appear to be awareness raising for the senior staff of the Ministry of Fisheries and generation of political will through better data on the extent of the sea safety problem.

6.3 Safety programmes

The Ministry of Fisheries presently has some involvement in promoting sea safety:

- A radio programme is sponsored every two weeks and the subject of sea safety is sometimes featured. According to Ministry staff, the last broadcast specifically covering sea safety was about two years ago.
- Inspection of all vessels over six metres for safety gear as required by the Fisheries Act. In practice, this appears to be limited to company-owned vessels.
- Distribution of SPC sea safety materials (stickers, posters, videos) and requesting the services of SPC masterfishers who are effective safety advocates.
- Membership in the National MCS Committee, where search and rescue is sometimes discussed.
- The Report of the Minister of Fisheries for 2000 states that one of the important functions of the Management and Licensing Section of the Ministry is "conveying views of the Ministry to the public/private sectors and other Government Institutions/Departments such as..... the Ministry of Marine and Ports for safety and seaworthiness of fishing boats.....".

The Tonga/AusAID Fisheries Project at the Ministry of Fisheries has several components dealing with sea safety. According to the project design document, the involvement consists of:

- The Masterfisher providing awareness raising and training in sea safety and aspects of seamanship to small-scale fishers, and enhancing the extension training skills of MoF counterparts in these areas. These activities are to be conducted both on shore through community-level workshops and the production and distribution of awareness materials,

⁷ A new fisheries act has been passed by Parliament recently. Because it has not yet received the assent of the King, the Fisheries Act 1989 is still in force.

⁸ Diving accidents, especially in the beche-de-mer fishery, were common before the export ban in the mid-1990s but the subject of diving is not covered in this report.

and at sea through interaction with boat crews and practical demonstration. The Project is to provide five HF radios to improve boat to shore communications in the outer islands.

- The Project establishing a grant scheme in consultation with the Ministry and stakeholders to assist men, women and youth groups in rural fishing communities obtain materials and equipment that will enable the establishment of small fisheries related enterprises or improve the safety and efficiency of fishing operations based on sustainable resources.
- The Project helping equip and fit out two nine metres Tongatapu-based vessels to undertake small-scale tuna longline fishing for a 12-month fishing trial. The Masterfisher is to provide practical demonstration and training on shore and at sea in vessel preparation, gear rigging and installation, fishing techniques, fish handling and aspects of seamanship and safety at sea.

The Ministry of Marine and Ports is involved in sea safety for fishing vessels as they are responsible for issuing survey certificates required for a fisheries licence. The Ministry of Marine and Ports also manages the Coast Watch radio scheme which receives regular radio position reports from vessels and broadcasts weather reports.

Other initiatives relevant to sea safety in fisheries in Tonga include:

- The Canada Fund is reported to have provided some basic sea safety gear.
- New Zealand has provided the services of a masterfisher to teach a workshop in Vava'u on sea safety, radio telephone use, and GPS navigation.
- The Emergency Services Section of the Ministry of Police indicates they have a radio awareness programme twice a month which features several minutes of sea safety in each broadcast.
- A course on search and rescue for the Tonga Navy by the US Coast Guard.
- Various safety courses are held at the Tonga Maritime Polytechnic Institute leading to certificates.

It is difficult to determine the effectiveness of the various sea safety programmes. Many Tongans cite the Ministry of Fisheries radio programme as the initiative they are most familiar with. The fishing companies seem to favour the safety courses at the Tonga Maritime Polytechnic Institute (TMPI). Staff of the Ministry of Marine and Ports point out that the manning regulations are effective, citing the fact that the worst recent sea disaster involved a fishing vessel that did not have crew with the proper certification.

The SPC-sponsored safety initiative that appears to be the best known on Tongatapu is the videos that have been periodically broadcast on television. The SPC sea safety posters are not common outside of the Ministry of Fisheries office. The larger companies appreciate the safety advocacy of the SPC masterfishers.

The important areas for future interventions appear to be:

- For small fishing craft: (1) Field-oriented safety extension work in outer island communities, and (2) Revitalization of the safety component of the radio programmes of the Ministry of Fisheries
- For the larger craft: additional safety courses at TMPI

6.4 Data recording

The Ministry of Police, the Ministry of Marine and Ports, and the Tongan Defence Services are involved in recording data on sea safety incidents.

As the Ministry of Police is the lead agency on search and rescue, they receive all initial reports of sea safety incidents. These are kept on file and, according to the staff of the Emergency Services Division, the information is extracted and summarized in the Annual Report of the Minister of Police. It was also explained that the annual police reports are available from the Government Printer and from the Police Headquarters.

Attempts were made to obtain copies of previous editions of the Annual Report of the Minister of Police. Visits were made to several police offices without success. The Government Printer indicated that they have not retained copies of the annual report since 1994. A copy of the 1995 Annual Report was found in the private collection of a Tongan journalist. The only information on sea safety it contained was (1) a summary of the activities of the police launch in Vava'u (3) incidents which may be fisheries-related, and (2) a summary of activities of the police launch in Ha'apai (one incident which may be fisheries-related). It can be concluded that the police annual reports are not especially useful for analysing incidents of sea safety in Tonga.

The Ministry of Marine and Ports is also involved in recording data on sea safety incidents. As with the police, important incidents involving the Ministry are recorded and subsequently filed. The staff of the Ministry of Marine and Ports indicated that the Ministry's involvement in search and rescue is summarized in the Annual Report of the Minister of Marine and Ports (as for the Police annual report, this is not available at the Government Printer), and occasionally in other reports prepared for various meetings, especially that for annual meetings of the Association of Pacific Island Maritime Training Institutions and Maritime Authorities (APIMTIMA).

The 2001 APIMTIMA report provides information the SAR operations in Tonga from August 1981 to November 1998. The report gives the date of the incident, the agency searching, the name of the missing vessel (or people missing), "Expenses Fuel or dollars" and comment. Ninety-nine incidents are given. Some of the incidents involve fishing vessels, but many concern yachts and for others the type of vessel cannot be determined from the summary information given (e.g. "4 Oct. 1996 Rescue Topex"). Some non-vessel incidents are also given (e.g. "11 Feb. 1995 Phanrom beaco"). The stated costs of the SAR operations range from between \$300 to \$137 700⁹. The comment section for most incidents is blank; "found", "not found", and "found later" is given for some of the incidents.

The 2002 APIMTIMA report gives the 2001 SAR activities: 14 incidents, of which nine were for fishing vessels, three for yachts, and two for inter island cargo vessels. No details are given.

Another report provided by the Ministry of Marine and Ports is titled "Search and Rescue 1999–2001". It gives the date and a short description of the incidents of SAR. In summary: 1999 – ten; 2000 – five; 2001 (through May) – four. Some of the incidents involve fishing vessels, some involve other types of vessels, and for some it is not possible to determine the type of craft. For example, one entry gives "Search for a vessel of about 15 metres owned by Mr Jones was overdue and later found everyone onboard including the boat were safe and sound".

The Navy also keeps records for the search and rescue operations that they are involved in. The report is made by the Captain of the patrol boat involved and is passed through the Commander of the Navy to headquarters where it is filed. According to Tonga Defence Services (TDS) staff, the search and rescue information is not normally summarized and no analysis is undertaken. TDS staff indicated that this is because of priorities, the most important of which is to return victims to land.

It is important to note that the data on sea safety incidents held by the Ministry of Police Ministry of Marine and Ports, and the TDS is limited to those operations in which they were involved. The operators of the larger fishing companies stress that most incidents involving the offshore vessels (tuna longline and snapper boats) are resolved within the company fleet or between companies. They indicate that, because of the cumbersome and lengthy procedures to initiate a government SAR operation, the companies often do their own search and rescue work, so the number of incidents reported to the Police or Marine is much less than the total number of actual incidents.

Some recent important sea safety incidents are:

- The most serious sea safety incident in recent years occurred in February 2002 when a snapper vessel belonging to Maritime Projects Tonga was lost with six men aboard. The

⁹ It is presumed that the currency is the Tonga Pa'anga but this is not stated.

vessel was fishing offshore and equipped with EPIRB, SSB radio and life raft. In a report by the fishing company (Niit, 2002), the probable causes were given as "run over by a cargo ship, seismic underwater activity causing enormous air bubble(s) to surface, a sudden whirlpool caused by a tromb [sic], or a freak "100 year" wave."

- The other major snapper fishing company, 'Alatini Fisheries, has lost three snapper boats but no lives: a 1994 grounding due to crew error, in 1996 a vessel caught in cyclone, and in 1999 another vessel caught in cyclone.

With respect to summarizing sea safety incidents in the past two decades, it appears that:

- Three agencies of the Tonga government have information in their files on incidents in which they were directly involved.
- Although summaries of the data may have been done by each Ministry, the only such compilation readily available in early 2003 was that of the Ministry of Marine and Ports.
- The level of detail in the three Ministry of Marine and Ports summaries covering the years 1981 to 2001 does not appear sufficient to enable analysis. In some cases the information does not allow a reviewer unfamiliar with Tonga vessel names to determine even what type of vessels are involved (e.g. fishing, cargo, etc.).
- Loss of life is especially difficult to determine from the summaries. From Ministry of Marine and Ports records for 1999–2001, only one entry appears to involve a fatality: "25/04/2001 A fishers from Fonoifua Island went for fishing and never come back, assumed to be dead".
- It does not appear that the summaries incorporate information subsequent to the SAR operation, such as later recovery of vessel/crew from Fiji or legal declaration of death.
- It is conceivable that with sufficient time, resources and high-level support, the files of all three agencies could be searched and this would yield adequate information for a productive analysis.

6.5 Legislation

With respect to sea safety, the Fisheries Act 1989 states:

- The registrar shall maintain or cause to be maintained a register of local fishing vessels and no local fishing vessel can be operated in the fisheries waters unless such vessel has been registered.
- On receipt of an application under the Registrar shall cause the vessel to be inspected. The Registrar may, where he is satisfied that a local fishing vessel inspected under this section is fit for fishing and meets any prescribed safety and hygiene standards, on payment of the prescribed fee, issue a certificate of registration in respect of that vessel.
- No local fishing vessel the length of which is six metres or more, other than a local fishing vessel used solely for sport fishing or for subsistence fishing, shall be used for fishing or related activities in the fisheries waters without a valid licence issued by the Registrar in respect of that vessel.

A new fisheries act has been recently been approved by Parliament. Because it has not yet received the assent of the King, the Fisheries Act 1989 is still in force. With respect to safety, the new act:

- States that "The Secretary shall maintain or cause to be maintained a Fishing Vessels Register and such other register or records as may be required under this Act. The Secretary may, where he is satisfied that a fishing vessel inspected under this section is fit for fishing and meets any prescribed safety and hygiene standards, on payment of the prescribed fee, issue a certificate of registration in respect of that vessel.
- Creates an offence for the "failure to use, carry on board a vessel or possess a class, type size, or quantity of fishing gear, navigational or safety equipment used in connection with fishing or related activity"
- Provides that the Minister may issue regulations to provide for "prescribing standards and other measures for the safety of local fishing vessels and fishers".

Two points regarding sea safety under the new act should be noted:

- The definition of "local fishing vessel" under the Act¹⁰ to which the safety provisions apply does not include locally-based foreign fishing vessels, several of which now operate out of Tongan ports and carry Tongans as crew.
- Unlike the older Fisheries Act 1989, the new act does not establish minimum size limits for vessels subject to the Act.

The Shipping (Amendment) Act 1999 is the major legislation relevant to the operation and safety of all vessels in Tonga. Unlike previous legislation, the Act specifically includes fishing vessels;

- "Every Tonga cargo ship, fishing vessel, or pleasure craft of 15 metres or more in length and every Tongan passenger ship carrying passengers for gain or reward shall be registered under this Act, as prescribed in the regulations"
- "Every Tonga cargo ship, fishing vessel, or pleasure craft of between eight and 15 metres in length shall be licensed under this Act, as prescribed in the regulations"
- The Act "does not apply to any vessel which is less than eight metres in length".

According to the Secretary for Marine and Ports, regulations under the Act have been formulated by SPC but not yet approved by the Minister for Marine and Ports. The Ministry is involved in satisfying Fisheries Act requirements for a fisheries licence as they issue safety certificates covering seaworthiness, covering the hull, machinery/equipment (including safety gear), and manning. The legal authority for manning requirements for fishing vessels is based on the regulations under the Shipping STCW Convention 1998.

Although the Fisheries Act requires the licensing of all vessels over six metres (except those used for subsistence and sport fishing), in practice only those boats used for commercial tuna longlining and offshore bottom-fishing are licensed and have the required safety certificate. This does not appear to have arisen from a policy decision but rather from ease of enforcement. As stated by the manager of one fishing company, "the Ministry only enforces the law on company boats, not those belonging to individuals". Because the companies tend to have better safety practices and search/rescue procedures, this may result in the safety requirements having the least effect on the most accident-prone vessels.

Some possibilities for improving sea safety legislation are:

- Assuring that legislation covers the types of vessels commonly involved with sea safety incidents, specifically the small fishing vessels which fish in offshore areas or which transit offshore areas for fishing activities should be subject to the legislation.
- An analysis of the causes of accidents on larger vessels may identify areas where more legislative attention is required.
- Enforcement could be improved by having an inter-Ministry field-oriented enforcement programme targeting the requirement for a fishing licence.

6.6 Boatbuilding and vessel design

In the early 1980s an FAO/UNDP/UNCDF initiative was undertaken to develop the deepwater snapper fishery by designing appropriate vessels, establishing three boatyards, constructing vessels and training fishers. Ministry of Fisheries records indicate that over the past two decades 46 FAO-designed vessels were built in the 20, 21, 28, and 32 ft categories. The best known of these vessels is the Ton-7, a broad-beam decked boat. The last one was built at the Ministry of Fisheries boatyard in 1997. As of early 2003, a small number of Ton-7 still participate in the snapper fishery.

At the request of the Ministry of Fisheries, FAO produced a concept for a tuna longliner for Tonga in the late 1990s. This design was not built due to the scaling down of the Ministry boatyard and

¹⁰ Under the new act a "local fishing vessel" means any fishing vessel (a) wholly owned by the Government of Tonga or by any Statutory Body established under any law of Tonga; (b) wholly owned by one or more natural persons who are Tongan subjects; or (c) wholly owned by any company, society or other association or persons incorporated or established under the laws of Tonga;

preferences of the fishing companies. The design also generated some controversy with SPC staff who was promoting larger vessels.

The FAO snapper boats have had a mixed effect on sea safety in Tonga. On one hand, the boats were quite seaworthy, constructed well, equipped with safety gear, and the owners received training on vessel operations, including safety aspects. The vessels and associated programme commenced the export snapper fishery which has been responsible for many of the major sea safety incidents in Tonga. The fact that the fishery targets seamounts, most of which are a considerable distance offshore, is the main difficulty.

Attempts to introduce sail on fishing vessels in Tonga have not met with much success. Most, if not all of the FAO designs built by the government boatyard were originally equipped with, or at least designed for, emergency or steadying sails. Over time, the owners did not replace the sails as they deteriorated. Few, if any, vessels, inshore or offshore, presently carry sails.

There is only a limited amount of boatbuilding in Tonga at present. The Ministry of Fisheries boatyard in Tongatapu, the subject of many external privatization initiatives during the past 15 years, completed the last FAO/UNCDF boat about five years ago and is mainly involved in small contract jobs, including repairs. The Ministry boatyards in Ha'apai and Vava'u are now doing cyclone repair work. Three very small boatyards are reported to exist (Tongatapu, 'Euaiki, Ha'apai). Some small wooden boats are built on a semi-commercial basis and one fibreglass firm occasionally builds skiffs.

The reality is that boatbuilding is expensive in Tonga and in the age of globalization, the market forces and preferences of fishers favour the use of mass produced skiffs from overseas. With respect to larger vessel for snapper and tuna fishing, the fishing companies much prefer to import new or used vessels from Fiji, New Zealand, Australia, Hawaii, or Asia. Boatbuilding skills in Tonga are therefore more likely to be used for repair of the existing fleet, rather than for major new construction initiatives. Given this boatbuilding situation, the main issue in Tonga in the interface between naval architecture and sea safety appears to be measures to assure that the imported vessels are safe. This may range from establishing import standards for mass-produced skiffs to identification of features important for the safety inspections of Chinese longliners.

6.7 Observations

The main issues in improving sea safety in Tonga appear to be:

- The frequency and severity of sea safety problems not being widely appreciated in Tonga.
- Lack of enforcement of fisheries licensing requirements and associated safety requirements for the smaller vessels.
- Most fisheries officers, other government officials, and representatives of fishing companies support mandatory safety requirements, but there is considerable apathy on the part of small vessel operators.

Some sea safety lessons-learned in Tonga:

- What is required to improve the safety of small fishing vessels is very different from that needed for the larger company-owned vessels.
- The best safety legislation is of limited value if not enforced.
- For a major improvement in safety on small boats, more is required than just programmes of awareness. Compulsory measures are needed but there does not appear to be the political will necessary to enforce such requirements.
- Without a good knowledge of the magnitude of sea safety problems in terms of number of incidents, lives lost, and cost to Tonga of search and rescue operations, it is easy to understand the lack of enthusiasm and political will for new sea safety initiatives.

7. Sea safety in Samoa

7.1 General

Samoa consists of two main high islands, Upolu and Savaii, and seven smaller islands, two of which are inhabited. Reefs enclosing narrow lagoons encircle much of the coastline except for the north coast of Upolu. Due to the proximity of neighbouring countries (American Samoa, Wallis and Futuna, Tokelau and Tonga) Samoa's EEZ does not extend to 200 nautical miles offshore in any direction. At 120 000 km², the Samoa EEZ area is the smallest in the Pacific Islands region.

The nation's capital, only urban area, and base of most commercial fishing operations is Apia, located on the north coast of Upolu.

Commercial fishing and sea safety in Samoa is closely linked with the "alia" catamaran fishing craft. Notable aspects of the fleet are given in Gillett (2002). The original plywood alia catamarans were designed by FAO in conjunction with a Danish-funded fisheries development project in the mid-1970s. The first 120 craft were constructed in plywood and then several hundred more were built from welded aluminium. In the early to mid-1980s the alia fleet numbered some 200 craft. Initially much of the fleet engaged in bottom fishing along the shelf area and reef slopes, landing high-value deep-water snappers for air-export to Hawaii. However as the deep-bottom resource became more heavily exploited, fishing effort began to be re-directed offshore, with fishers targeting skipjack and small yellowfin tuna by trolling around fish aggregation devices (FADs). The fleet was reduced still further, to only 40 vessels, as a result of the destruction caused by two severe cyclones which struck Samoa in 1991.

The introduction of effective small-scale longline fishing techniques and gear in the early 1990s saw the number of alia grow rapidly during the decade. The development in the mid-1990s of an export market for albacore and other tuna resulted in further expansion in the fishery. The status of the tuna fleet in 2000 was:

- Conventional nine to ten metres alia: about 119 vessels operating; 63 percent based in the Apia urban area.
- Ten to 12.5 metres catamarans and monohull longliners: about 20 operating; 89 percent based in the Apia urban area.
- 12 to 15 metres catamarans and monohull longliners: nine operating; 100 percent based in the Apia urban area.
- Monohull longliners greater than 15 metres: six operating; 100 percent based in the Apia urban area.

Watt and Imo (2002) state that a total of 149 vessels participated in the Samoa longline tuna fishery in 2001: 116 vessels less than ten metres in length, 14 vessels over ten metres and up to 12.5 metres, eight vessels over 12.5 metres and up to 15 metres, and 11 vessels over 15 metres. Because of the poor tuna fishing in early 2003, the active alia fleet (vessels in the category of "less than less than ten metres") has contracted considerably. In February 2003, only 17 alia were active in the Apia area and about 20 to 25 in rural areas. The size of the alia longline fleet has actually contracted more than these numbers suggest as many of the active boats participated in fisheries other than tuna longlining (bottom fishing, trolling).

A typical safety incident at sea in Samoa involves an alia, or modified alia, fishing more than 25 nautical miles offshore which has either (a) suffered a engine problem, or (b) been so heavily loaded that it has swamped, or (c) lost sight of the island and has travelled in the wrong direction until the fuel has been expended. Over the years, Samoan fishers have drifted to American Samoa, Niue, Tonga, Wallis, Fiji, Solomon Islands, Papua New Guinea and Vanuatu¹¹.

¹¹ Alia sea safety incidents are not restricted to Samoa. In July 1994 two men floated for two days after their alia (previously owned by FAO) sank off Beqa Island in Fiji.

7.2 Fisheries management and sea safety

Samoa's main fishery categories are the small-scale inshore fisheries and the offshore commercial fishery. The management objectives and strategies for these two categories are quite different.

According to the Fisheries Division, the goal of the government intervention in small-scale inshore fisheries is for a village to effectively manage their own fisheries resources. The strategy to achieve this goal is for the Fisheries Division to assist each coastal village to develop its own Village Fisheries Management Plan and subsequently for the Fisheries Division to provide management support. At the village level the objectives of management are usually related to safeguarding seafood supplies. Because of the large number of coastal villages in Samoa (about 230), there are consequently a large array of management measures used in the individual fishery management plans. The most common are:

- banning the use of chemicals and dynamite to kill fish;
- banning the use of traditional plant-derived fish poisons;
- establishing small protected areas in which fishing is banned;
- banning other traditional destructive fishing methods (eg smashing coral);
- organizing collections of crown-of-thorns starfish;
- enforce (national) mesh size limits on nets;
- banning the dumping of rubbish in lagoon waters.

These management measures are not likely to have an effect on the sea safety situation. A possible exception to this is that in some villages the measures may reduce the inshore fisheries opportunities and therefore may encourage some individuals to fish in the less restricted offshore areas.

For the offshore commercial fishery, the Cabinet-adopted tuna management plan states "the aim of managing the longline tuna fishery in Samoa should be to maximize catch-rates, profits and foreign exchange by restricting the number of boats in the fishery. This should be tempered with the secondary aim of encouraging wide and local participation in the fishery". Recent action by the government also suggests that another important management objective is to reduce the number of lives lost at sea in the fishery.

The latest tuna management plan was approved by Cabinet in February 2002. The new plan includes provisions for the following numbers of vessels:

- Class A: vessels up to and including 11 metres: Licences available: No limit
- Class B: vessels over 11 metres and up to 12.5 metres; Licenses available: 19
- Class C: vessels over 12.5 metres and up to 15 metres Licences available: 21
- Class D: vessels over 15 metres and up to 20.5 metres; Licences available: 16
- Class E: vessels equal to or greater than 20.5 metres; Licences available: 9

Another management restriction is that large vessels (those over 15 metres) are prohibited from fishing within 50 nautical miles of any land within Samoa's EEZ.

The above management measures have several effects on sea safety. The exclusion of large vessels in the area within 50 miles of the coast creates some incentive for the smaller, more accident-prone vessels to operate closer to shore. During periods when there is considerable interest in tuna longlining, it is conceivable that the only licences available are for the small Class A vessels, which have the worst safety record. Presently, however, there are licences available in the other categories.

Although sea safety is not specifically articulated as an objective of the management of the tuna fishery, government interventions in the fishery in the past few years indicate that prevention of loss of life at sea is an important goal. This is evidenced by safety provisions in Fisheries Amendment Act 1999, Local Fisheries Regulations 1995, and the Small Vessel Safety Regulations 1999 under the Shipping Act 1999.

7.3 Safety programmes

The major initiative of the Fisheries Division in sea safety is communication with the longline fleet. According to a recent annual report of the Fisheries Division, “the Fishermen Safety at Sea Radio Communication Network has remained one of the Fisheries Division’s most successful contribution to the fishing industry. The fishing vessel owners as well as the fishers have appreciated the services offered not only for daily monitoring of the vessel movements but for the provision of weather forecasts and information about fishing grounds. Through the availability of free communication system, they are well advised of the arrival time and be informed immediately should the vessel encounter any problems whilst fishing. At the time of this report, there are close to 300 fishing vessels and users currently utilizing the system”. The system was upgraded in the late 1990s and now has extra VHF channels for both Upolu and Savaii, 11 repeater stations, five SSB channels, and continuous 24-hour monitoring. In addition, 100 VHF radios have been provided to alia craft.

Another major sea safety initiative in Samoa concerns legislation. The large loss of life from fishing craft in the mid-1990s led to formulating, enacting, and enforcing both fisheries and shipping regulations for small fishing. This is covered in Section 7.5 below.

Other sea safety programmes in Samoa in the past decade have included:

- Basic navigation courses hosted by the Fisheries Division.
- Five surveyors at the Ministry of Transport have been trained in small fishing boat survey techniques.
- The Ministry of Transport requirement that boats be built using approved plans by approved boatbuilders.
- A “talk-back” radio show on sea safety sponsored by the Ministry of Transport.
- The Samoa Polytechnic School of Maritime Training conducts courses to improve small fishing vessel safety: (1) Class 6 Master/Engineer, and (2) Basic Safety Certificate.
- The US Coast Guard demonstration of the use of flares, reflectors, streakers, and other SAR devices for fishing vessels in April 2002.

SPC sea safety materials have been distributed by the Fisheries Division. According to the Division’s staff, the materials have included posters, stickers, check lists, and videos. Several posters are presently displayed in the main office of the Fisheries Division. The staff indicates that perhaps the videos (especially the one about the Kiribati fishers) are the most effective. They also comment “fishermen don’t use check lists”. Individuals outside the Fisheries Division with a connection to sea safety (Ministry of Transport officials, Police officials, fishing gear store owners) seem to be only vaguely aware of SPC sea safety materials other than the videos which are sometimes broadcast on television.

With respect to the effectiveness of the various safety programmes, the new regulations and associated enforcement seems to be by far the most effective initiative. As indicated by one senior staff at the Fisheries Division, “the big stick approach to enforcement is the only thing that works”. An example was given of an alia owner who, after having his vessel drift to another country, still did not equip his vessels with safety equipment until threatened with legal action. Alia crew say that the basic safety course at the Samoa Polytechnic School of Maritime Training is good, citing the fact that many crew are plantation boys who know nothing about the sea and certainly not knowledgeable enough to refuse to go to sea on an unsafe boat.

On the basis of the short visit to Samoa, it appears that sea safety programmes in Samoa could be further improved by:

- Having programmes targeting the vessels/areas/seasons indicated by the analysis of the sea safety data. Specifically, Section 7.4 below shows that alia (especially modified alia) based in rural areas in the months of August and September is especially prone to accidents.
- Improving the enforcement of fisheries/transport regulations, especially in the rural areas.

- Increasing the frequency of the fisheries/safety courses at Samoa Polytechnic School of Maritime Training, and improving access to these courses for skippers and crew from rural areas.

7.4 Data recording

The present system for recording information on sea and rescue operations of the Samoa Police, Prisons and Fire Service for maritime search and rescue commenced in 1996. According to the Maritime Surveillance Adviser, when each sea safety incident is reported, a detailed form is filled out. Each event is summarized in a database: sequential number, date, vessel type, and owner, number persons on board, area, sea asset hours, air asset hours, and remarks. This summary information can be further summarized by year as:

Year	Number of SAR Incidents	Number of Lives Lost	Remarks
1996	3	0	
1997	24	17	Two incidents involved non-fishing operations: ferry, yacht
1998	26	7	One incident may be non-fishing
1999	5	3	
2000	20	5	
2001	22	6	One vessel recovered in PNG
2002	7	0	
Total	107	38	

The Fisheries Division maintains an independent list of fisheries-related sea safety incidents involving loss of life. According to the responsible officer, the list spans the period from 1996 to the present. The list contains 17 incidents and 39 lives lost.

Some of the differences between the two lists could possibly be accounted for by (a) the police including incidents not related to fishing vessels, and (b) not correcting lists for people who turn up on some distant island months later.

Analysis of the data available to the Fisheries Division shows:

- 1997 was the worst year.
- Most losses have involved the modified alia.
- Most recent disasters have involved alia based in Savaii which is largely outside of the reach of authorities responsible for enforcement of sea safety regulations.
- August and September are by far the worst months for fatal incidents. This is thought to be due to the fact that those months have both good fishing and strong winds.
- There have been no deaths at sea in vessels over 12 metres.
- Several vessel owners were involved in more than one incident, including one owner having four in one year and another having three in two years.
- The accident rate is quite high. Thirty-nine lives have been lost from Samoa's tuna longline fishery which has been estimated to have about 674 sea-going jobs.

The above information has implications for enforcement of the sea safety. It would suggest that compliance operations should focus on alias based in rural areas just prior to August.

7.5 Legislation

The important legislation in Samoa for sea safety in fishing vessels is:

- Fisheries Amendment Act 1999
- Local Fisheries Regulations 1995
- Shipping Act 1998
- Shipping (Small Vessels) Regulations 1999

The Fisheries Amendment Act 1999 (and subsidiary legislation) is the responsibility of the Ministry of Agriculture, Forestry, Fisheries and Meteorology. The sections of the Act relevant to sea safety are:

- (1) The Director shall maintain a register of local fishing vessels engaged, at any time, in commercial fishing activities.
- (2) Subject to subsection (3), no local fishing vessel shall be operated in the fishery waters unless such vessel has been registered under this section.
- (3) Subsection (2) shall not apply to any local fishing vessel used solely for sport fishing, pleasure, recreation or for subsistence fishing.
- (4) An application for registration shall be made to the Director in the form approved from time to time by the Director, and shall be accompanied by the prescribed fee.
- (5) Upon receipt of an application the Director may cause the vessel to be inspected.
- (6) The Director may issue a certificate of registration if he is satisfied that (a) The vessel is in all respects fit for fishing and equipped with all necessary life-saving appliances and apparatus; and (b) Any safety certificate required under the Shipping Act 1998 and its Regulations is current in respect of that vessel; and (c) The vessel and its proposed operations are otherwise in complete compliance with the requirements of the Shipping Act 1998 and its Regulations; and (d) The vessel and its proposed operations are in complete compliance with any other matters or conditions that may be prescribed.

The relevant sections of the Local Fisheries Regulations 1995 state:

- (1) Where a certificate of registration has been issued in respect of a local commercial fishing vessel under section 5 of the Act, the Director may by notice in writing to the owner of the local commercial fishing vessel in addition require that the vessel is equipped with any or all of the following:
 - (a) a two way radio;
 - (b) an anchor rope of no less than two hundred metres (200 m) in length and an anchor;
 - (c) two functioning outboard engines;
 - (d) navigation lights;
 - (e) such other equipment that he considers necessary or desirable for the safety of the vessel.
- (2) Where a local commercial fishing vessel puts to sea without such equipment as may be required under the preceding paragraph, or in contravention of section 5 of the Act, the Director may revoke the certificate of registration issued under section 5 of the Act, and the owner master and charterer each commits an offence against these regulations.

The Shipping Act 1998 states that regulations can be made “in respect of all vessels, including fishing vessels”. This act (and subsidiary legislation) is the responsibility of the Ministry of Transport.

The Shipping (Small Vessels) Regulations 1999 “apply to all vessels in Samoa waters that are less than 15 metres in length”. The regulations stipulate that the vessels covered must have safety and seaworthiness certificates and be registered with the Ministry of Agriculture, Forestry, Fisheries and Meteorology. The regulations cover (as summarized in GRM, undated):

- Licensing of vessels
- Display of registration
- Construction of vessels
- Safety equipment
- Manning, training, and certification
- Report of intended journeys
- Use of radios
- Rules applying to vessels within harbours
- False distress alarms
- Inspections
- Surveys
- Offences and penalties

- Transitional provisions

Important provisions include:

- The required safety gear is for two categories of operation: within 20 nautical miles of shore, more than 20 miles
- For vessels operating more than five nautical miles from the coast there are manning requirements. For vessels in which the combined engine power is less than 350 horsepower (250 kw), the skipper is required to hold a Class 6 Master/Engineer certificate and “a number of crew” must hold the basic safety certificate.

The Maritime Division of the Ministry of Transport has the responsibility for inspection of vessels as required by the Shipping Act 1998 and subsidiary legislation. To accommodate this, five surveyors at the Ministry of Transport have been recently trained in small fishing boat survey techniques.

The enforcement of the safety regulations is done jointly by the police, Ministry of Transport, and the Fisheries Division of the Ministry of Agriculture, Forestry, Fisheries and Meteorology. According to an official of the Ministry of Transport, an enforcement plan is formulated at the beginning of each year. The main enforcement problems are:

- Enforcement in rural areas
- Coordination between three government agencies during an enforcement operation; Differing priorities of the three agencies
- Administrative problems during preparation for prosecutions

From the analysis of the data on sea safety incidents, it can be seen that alia based in rural areas suffer a disproportionate amount of accidents at sea. This would suggest that additional enforcement focus on areas away from Apia is required. The data may also indicate that enforcement just prior to the August – September period would be most effective at reducing loss of life.

7.6 Boatbuilding and vessel design

FAO designed the original 8.6 metres plywood alia catamaran in 1974. Additional plans were produced by FAO in 1976. In 1980 plans were produced for an 8.9 metres aluminium alia (three sheets: structural arrangements, sections 2/6, and plate plan and press).

The original plywood alia was designed with an emergency sail of 12.3 m². Fisheries Division officials do not recall the use of sail, and certainly not in the past decade.

Over the years the design of the alia has been modified by both designers and builders. Data on sea safety incidents shows that most of the serious accidents are associated with modified alia designs. During the alia construction boom of the mid–1990s many of the catamarans were poorly constructed and had serious design flaws (e.g. insufficient buoyancy resulted in alias sinking after being swamped).

To address the issue of poor designs and poor construction, the Shipping (Small Vessels) Regulations 1999 has design/construction requirements. The Regulations state: “all vessels must be built to the specifications and in accordance with the construction plan approved by the Secretary. Specifications and construction plans submitted for approval must have the endorsement of a qualified naval architect or any other competent person authorized and recognized by the Secretary”.

According to staff of the Fisheries Division, five boatbuilders are currently approved by the Secretary of Transport. This is a very slack period for fishing vessel construction in Samoa because there are a very large number of repossessed vessels being sold cheaply by the Development Bank.

In response to the reality that tuna longlining far offshore from a small undecked catamaran is inherently unsafe, the Fisheries Division promoted in the late 1990s the concept of larger and safer “super alia” catamaran. Faasili et al. (2000) states “The newly designed 40 ft alia prototype planned to be the next generation of alia fishing boats was completed in April 2000. The boat, which was fully equipped cost about T\$371 000 (about US\$120 000) was scheduled to undertake a six-month fishing trial to determine its economic viability.” Some fishers are, however, of the opinion that for tuna longlining, better and cheaper vessels are available overseas.

Given this boatbuilding situation, the major issues in Samoa in the interface between naval architecture and sea safety appear to be:

- Prevention of the safety problems that occurred during the alia boom of the mid–1990s because of poor design and poor construction.
- In the compromise between cost and safety for small tuna longliners, whether there is such an item as the often-mentioned but elusive “safe, practical, and affordable vessel”.

With respect to vessel design work, Fisheries Division officials, although grateful to FAO for past efforts, feel that at this point safety improvement initiatives should focus on enforcement of legislation, awareness programmes, and safety training, rather than naval architecture.

7.7 Observations

The major issues in improving sea safety in Samoa appear to be:

- The large difference in safety issues between vessels based in the Apia urban area and those in remote locations.
- The sea safety concerns of owners are very different from those of skippers/crew.
- Balancing the need for safety training of vessel crew with the reality of large crew turnover.

Some sea safety lessons-learned in Samoa:

- Mandatory requirements accompanied by a “big stick” approach to enforcement has worked best.
- In terms of voluntary expenditures by vessel owners, safety gear receives low priority.
- The analysis of past data on sea safety incidents can be very useful for future safety programmes.
- There is a very big difference between vessel owners and those that go to sea with respect to sea safety. To be effective, the penalties for non-compliance must cause substantial pain to the offending owners.
- There is a need to educate skippers and crew to refuse to depart for sea on an ill-equipped vessel.

8. Sea safety in Fiji

8.1 General

Fiji is an archipelagic nation comprising about 322 islands with a total land area of 18 272 km² and a surrounding EEZ of about 1.3 million km². The group includes two large high islands, several medium-sized high islands, and numerous small islands and atolls. Most of the islands are surrounded by fringing and barrier coral reefs. Much of Fiji’s coastal waters occur off the main islands of Viti Levu and Vanua Levu and the islands of the Mamanuca and Yasawa groups. Fiji’s capital and main urban area is the city of Suva on the southeast of Viti Levu.

According to Fisheries Department (2002), in 2001 there were 830 vessels participating in the artisanal fisheries: 30 unpowered, 348 outboard powered, 380 inboard powered, and 72 skiffs. These vessels had a total of 2 443 crew. According to a recent study by the Forum Fisheries Agency, in December 2002 the locally-based offshore tuna fleet consisted of 96 longliners and one pole/line vessel, employing a total of 893 crew.

Important features of Fiji relevant to sea safety include:

- High incidence of cyclones in the November to April period.
- Significant amount of inter-island transport on small boats, many of which also serve as fishing vessels.
- Two very different fishing fleets (offshore tuna, inshore artisanal) which are associated with very different sea safety issues.
- Substantial SAR assets including the Navy and domestic airlines.

According to the Fiji Navy, small boat activities account for about 95 percent of the sea safety incident reports and characteristically involve mechanical problems; difficulties associated with poor weather, or capsizing. On the other hand, the problems of the larger fishing vessels (mainly tuna longliners) usually involve grounding, sinking, or engine problems. The more spectacular disasters (e.g. sinking of the F/V Wasawasa in 1997 with the loss of ten lives) are often the catalyst for greater government intervention in sea safety.

8.2 Fisheries management and sea safety

The broad objectives of management interventions in the fisheries sector are suggested in the mission statement of the Fisheries Department: “to provide sustainable management and development of the nation’s fishery with the aim to create employment, increase foreign exchange earnings, and improve the standards of the rural people through capture fisheries development and a well-coordinated support service programme”.

To achieve the objectives, the government has a variety of management strategies. These include the promotion of fisheries activities which both divert effort away from over-exploited inshore areas and which have favourable business opportunities (tuna fishing, aquaculture), devolution of management responsibilities to coastal communities, a nation-wide system of licensing commercial fishers to fish inshore areas where permitted by local authorities, and control of aspects of coastal commercial and the offshore tuna fisheries by conventional centrally-administered regulations.

In the coastal commercial fisheries, the main management interventions are:

- requirement for commercial fishers to be licensed (960 licences were issued in 2000);
- size limits (e.g. regulations specify minimum sizes for 19 species of fish);
- gear specification (e.g. mesh sizes for nets);
- banned fishing methods (e.g. use of explosives);
- requirement for an export permit for marine products: The Customs Department, acting as agents for the Fisheries Department, will not authorize the release of an export shipment of fishery products without an export permit from the Fisheries Department;
- bans on the export of certain species: regulations ban the export of *Tridacna derasa*, *T. squamosa*, *T. maxima*, *Holothuria scabra*;
- requirement for approval from traditional authorities before a licence is granted to an outsider for fishing in any of the 406 areas under traditional jurisdiction;
- diversion of commercial fishing effort to offshore areas by the use of fish aggregation devices (FADs) to utilize the abundant offshore tuna resources;
- promotion of commercial aquaculture with the intent of relieving some fishing effort from inshore areas (giant clam) and to re-stock areas which have been over-exploited (*bêche de mer*), and for alternative sources of income for coastal communities (seaweed);
- use of marine protected areas: these are mostly initiatives of NGOs, usually working through the government environment agency.

These management measures for the coastal commercial fisheries are not likely to have much effect on the sea safety situation. Possible exceptions to this are:

- some measures may reduce the coastal fisheries opportunities and therefore may encourage some individuals to fish in the less restricted offshore areas;

- the use of FADs may cause more small boats to fish offshore. On the other hand, those small boats habitually fishing offshore tend to concentrate their fishing around FADs resulting in a less risky situation.

One of the requirements for obtaining an “outside demarked areas” fishing licence is a vessel inspection which, according to the responsible individual at the Fisheries Department, includes a vessel check to ensure seaworthiness.

For the offshore tuna fisheries, a new tuna management regime commenced in 2002 with the adoption by Cabinet of the Fiji Tuna Development and Management Plan. The “national objectives” of the Plan are to:

- address the conservation and management of tuna resources within Fiji waters;
- highlight development policies for maximum utilisation of the tuna resources without compromising the long-term economic, political and resource sustainability;
- determine the level of sustainable fishing effort, distribution of licences as well as total allowable catch within Fiji’s EEZ;
- provide policy direction to government towards new areas for development that would increase the economic gains from tuna fishing.
- Make recommendations on institutional changes that would ensure transparency, accountability and efficiency within the Fisheries Department;
- determine changes to fees paid to government in terms of licensing fees, export permits and processing permits.

Major features of the Plan are:

- catch limits (provisionally 15 000 tonnes);
- licence limits (presently 90 available);
- licence criteria that favour people from Fiji, especially indigenous Fijians;
- collection of substantial fees from domestic vessels (presently about US\$10 000 for vessel over 20 metres);
- development options are also presented in the Plan, including components on awareness programmes and small-scale fisheries training.

Safety does not feature prominently in the Fiji Tuna Development and Management Plan. The only provision regarding this subject in the text is “The Ministry will create a Fisheries Training School to provide training to the fishing industry. At the Fisheries Training School, the Ministry will create a three to four weeks induction course for people wishing to enter the tuna fishery as a crewman, so they can gain the basic skills needed for this work, plus gain the required sea safety certificate”. In the Plan’s development options section, the awareness programmes seem to be limited to “reduce the risks to communities associated with the problems of alcohol abuse, HIV/AIDS and STIs”. The Plan’s section on small-scale tuna fisheries training does not specifically mention safety training.

For tuna fishery management in general, there are safety-oriented management interventions by the Fisheries Department. The major measure is the requirement that for a vessel to obtain a tuna fishing licence from the Fisheries Department, they must have a safety certificate from the Fiji Islands Marine Safety Administration (FIMSA). This certificate covers the hull, engine, and safety equipment.

From the above, it can be seen that the concept of including safety in fisheries management is not prominent in Fiji. Although there does not appear to be major objections to doing so, the advantages of specifying safety as one of the management objectives are not widely appreciated. One possible difficulty is that the legal authority for fisheries management in the country, the Fisheries Act, is oriented to “regulating matters relating to the conservation, protection and maintenance of a stock of fish”.

8.3 Safety programmes

Several government agencies in Fiji have sea safety programmes, including the Fisheries Department, the Fiji Islands Marine Safety Administration (FIMSA), and the Fiji Navy.

The Fisheries Department's recent involvement in sea safety has consisted of:

- enforcing the requirement that for a vessel to obtain a tuna fishing licence there must be a safety certificate from FIMSA;
- enforcing the requirement that to obtain an "outside demarked areas" fishing licence, there must be a vessel inspection by the district fisheries licensing officer;
- cooperating with FIMSA with a view to improving sea safety legislation;
- distributing SPC sea safety materials;
- the 18 fisheries stations periodically undertaking fisheries extension sessions which occasionally have some safety component;
- in 1993 to 1995 the Fisheries Department had a fish quality control project in which an extension team travelled to rural villages. A small sea safety component was attached to the project and took advantage of the generator and video set to show safety videos.

According to staff of FIMSA, the sea safety involvement of the agency consists of:

- work specified under the Marine Act and subsidiary legislation: e.g. issuing safety certificates and checking vessels before they depart for fishing. A change in the Marine Act in 1999 so that fishing vessels, previously excluded from the safety provisions of the Act, became included;
- radio broadcasts in Fijian on sea safety on Sunday mornings;
- writing articles in Fijian for the government publication "Na Mata": e.g. problems of fibreglass boats in the April – June 2002 issue;
- attendance at district and provincial meetings to disseminate material information on sea safety;
- convening meetings with builders of boats less than ten metres to formulate safety standards.

The Fiji Navy's involvement in sea safety is related to both search and rescue and safety awareness:

- management of the Maritime Surveillance Centre;
- operation of the patrol vessels;
- participation in the disaster awareness programme;
- village sea safety awareness visits during vessel patrols;
- participation of Navy officers in television and radio shows.

Not much information is available on the effectiveness of the above sea safety initiatives. Several individuals interviewed during the survey in Fiji have indicated that there seems to be a greater awareness of safety issues and a noticeable increase in the number of small vessels carrying at least some safety gear (including mobile telephones). It is not clear what was responsible, but the general feeling was that the awareness programmes were having an effect.

The inclusion of fishing vessels in safety provisions of the Marine Act and subsequent strict enforcement of those and other safety regulations applicable to fishing vessels has occurred. Although the impact on safety is uncertain, the fishing fleet operators are quick to point out irregularities in the system of checking fishing boats prior to departure from port.

The SPC sea safety materials, except for the videos, are not widely known in the Suva-based fisheries industry, the Navy, and FIMSA. When the videos can be shown in remote villages, they are well-received. It appears that potential channels of distribution to remote villages (Navy and FIMSA) for the printed materials are not being utilized.

Possible improvements to sea safety projects include:

- greater cooperation and coordination between the Fisheries Department, Navy, and FIMSA in safety promotion efforts. Ironically, senior staff in the three agencies appeared unaware of the other's awareness projects;
- distributing more safety materials to remote villages by taking advantage of the visits of the three agencies to those areas;
- greater use of radio in safety awareness programmes;
- greater assertiveness of fishing industry representation on the Marine Board to improve the effectiveness/relevancy of safety promotion efforts, especially the system of checking fishing boats prior to departure.

Chapman (2002) made recommendations about sea safety initiatives for tuna vessels in Fiji. He stated:

- The "Skipjack Project" implemented by Fisheries off Suva provided 36 skiffs and outboards to local fishers, with the fishers encouraged to fish offshore around the FADs. No safety equipment or sea safety training was provided to any of the fishers as part of this project. This should be changed for any future project, with the boat and outboard not only provided with fishing equipment, but also sea safety equipment.¹²
- Having sea safety equipment on board a small-scale fishing vessel is no good if no one knows how to use it. Therefore the Fisheries Division, through their Extension Section, should run a sea safety awareness campaign including the use of the equipment, for all small-scale fishers, not just those in the future that they will be assisting into new boats. SPC has materials that could be used as part of the awareness campaign. Coupled with this should be regulations, under either the Fisheries or Marine Legislation, that require that the sea safety equipment be carried on board the boat at all times.

8.4 Data recording

Staff of FIMSA indicates that they are commencing a project to record sea safety incidents, but the system is not yet operational. Some information on maritime accidents can be found in FIMSA's annual report, but this is largely oriented to the results of the work of marine investigators for large ships.

The Navy's Maritime Surveillance Centre receives sea accident reports from all government agencies. It produces various summaries of incidents which are defined as reports reaching MSC causing SAR action: patrol boat search, aircraft search, or coordination of efforts. Summary data for the past 13 years is tabled below:

Year	Incidents	Lives lost	Cost (Fijian \$) ¹³
1990	45	7	22 549
1991	51	1	39 200
1992	43	14	112 201
1993	52	10	42 042
1994	74	5	28 956
1995	54	23	39 027
1996	41	7	38 267
1997	65	17	27 141
1998	67	21	36 580
1999	51	9	20 385
2000	67	21	118 947
2001	62	8	35 400
2002	51	13	130 000

¹² According to the Acting Director of Fisheries, this has been recently addressed.

¹³ In early 2003 one US dollar was about two Fijian dollars. The SAR cost is calculated on the basis that (a) a search by the patrol boat at 15 knots would use 346 litres per hour, (b) fuel costs F\$.79 per litre, (c) food rations and a 30 percent charge to cover miscellaneous expenses is added to the fuel costs to determine the total cost of each operation.

For each year, more detailed data with respect to type of incident is available. Information for the year 2002 is shown below.

Month	Overdue	Distress	Drowning	Medevac	Grounding	Capsize	Engine breakdown	EPIRB	Total
Jan.	2						1		3
Feb.	3								3
Mar.	4								4
Apr.	5					1			6
May	3	1			1	1			6
June		1				1			1
July	1	1		1	4			1	8
Aug.	5	1			1				7
Sept.	2				1				4
Oct.	1			1		1			3
Nov.	2	1	1					2	6
Dec.									0
Total	28	5	1	2	7	4	1	3	51

It was not possible to obtain additional data on each incident during the short period of the Fiji survey, but as the information exists at the Maritime Surveillance Centre, it could conceivably be extracted and summarized. Discussions with the Fiji Navy's Maritime Commander indicate:

- about 70 to 80 percent of the incidents on the table involve fishing operations;
- of these accidents that involve fishing operations, about five percent concern the relative large offshore tuna longliners, with the remainder being small coastal craft;
- as many vessels are "fishing boats one day, transport boats the next day", the distinction between sea accidents related to fishing and to other types of activities is not clear.

The Fiji Times occasionally contains summaries on "boating accidents". For example, on 23 June 1995 a summary of the 15 accidents to have occurred January to June of that year was given in a feature article on sea disasters.

Although the Navy appears to be doing an important job in collecting and summarizing the SAR statistics, it is unclear if the other agencies involved (FIMSA, Fisheries Department) are analysing and/or utilizing the data produced by the Navy. Discussions with a limited number of staff in those agencies did not reveal that much use was made of the Navy data. More time is needed to explore this subject in order to make substantive conclusions on sea safety accident data in Fiji.

8.5 Legislation

Sea safety is not covered in the Fisheries Act or subsidiary legislation. This situation is likely to have arisen because of the limited scope of the legal framework in the fisheries sector; the laws/regulations are oriented to "regulating matters relating to the conservation, protection and maintenance of a stock of fish".

In proposed legislation (Fisheries Management Bill 2002) there is some provision for sea safety. It is stated: "The operator of each licensed vessel shall be subject to and ensure compliance with the following licence terms and conditions..... [including] compliance with all laws of Fiji, in particular laws relating to navigational standards and the safety of vessels at sea."

Most of the legislation dealing with sea safety in Fiji is found in the Marine Act 1986, the Marine Regulations 1990, and the Marine (STCW) Regulations 2001.

The Marine Act 1986 has a sea safety section (Part IV) but fishing vessels and vessel less than ten metres were specifically excluded. In 1999 an amendment to the act was made eliminating the exclusion for fishing vessels. Important provisions of the Act for sea safety include:

- requirement for vessels to be checked for “danger” prior to departure for sea;
- authority for FIMSA to issue a safety certificate and requirement for vessels to possess a valid safety certificate;
- authority for Ministry to (a) exempt fishing vessels from the safety section (Part IV) of the Act, and (b) make regulations for vessels under ten metres.

The Marine Regulations 1990 have several sections applicable to fisheries-related sea safety:

- declaration by the Minister that the safety and seamen provisions of the Act (Parts IV and V) apply to fishing vessels of ten metres or more;
- creates a specific offence for fishing vessels that proceed to sea with fewer qualified seamen than prescribed by a regulation;
- establishes requirements (Fiji Small Craft Code) for commercial vessels under ten metres, including qualifications for seamen, survey certificate, construction and safety equipment. The regulation creating the Code give the applicability as “commercial vessels less than ten metres in length” whereas the actual code text states “vessels of ten metres in length trading commercially”.

The applicability of the Marine (STCW) Regulations 2001 includes Fiji vessels (“a vessel which is registered or licensed in Fiji”), seafarers employed on Fiji vessels, and owners and masters of Fiji vessels. Its main relevancy to sea safety issues in Fiji concerns the manning requirements. The regulations specify the fishing certificates required by vessel size and by distance offshore of operation (unlimited, near-coastal, territorial, and inshore). The requirements for the various fishing certificates are also stipulated with respect to minimum age, prerequisite certificate, required sea service, course of study, other certificates required, and examination.

The authority to inspect fishing vessels is given by the Marine Act to the Director of Marine, which is presently the senior officer in the Fiji Islands Maritime Safety Administration.

With respect to enforcement of sea safety legislation, there are several important issues:

- For commercial fishing vessels under ten metres, the requirements are so extensive (the Small Craft Code is 67 pages in length) and the requirements so unreasonable (for example, a seven metres fibreglass fishing boat requires a gangway, life raft, barometer, six hawsers). In practical terms, the requirements are ignored by the fishing fleets and enforcement is irrelevant.
- On larger vessels, the requirement for a safety certificate is effectively enforced by the Fisheries Department’s policy of “no safety certificate, no fishing licence”.

The Navy quickly points out that the effectiveness of sea safety legislation could be improved if they are allowed to enforce at sea rather than just “watch vessels sink”. The Marine Act gives enforcement authority to “shipping inspectors” but the Navy has not been delegated this authority. From the FIMSA perspective, giving the Navy enforcement powers is inappropriate as it would involve the military in domestic law enforcement.

As most of the serious sea accidents in Fiji are associated with small fishing vessels, it is important to reform the unrealistic sea safety requirements for these craft.

8.6 Boatbuilding and vessel design

FAO’s major contribution to fishing vessel design in Fiji was the 8.6 metres inboard diesel (FIJ-5). Originally designed for Samoa, it was modified for use in Fiji in the mid–1980s and about 250 have been built at the Fisheries Division boatyard in Lami in conjunction with a fisheries development programme. That initiative was reviewed by FAO in May of 1991. The building of the FIJ-5 ceased in June of 1993 which, according to Fisheries Division (1994), was due to “the donor country Japan had ceased the supply of marine diesel engines”.

FAO also designed the 6.4 metres inboard diesel vessel. Only three have been built at the Fisheries Division boatyard.

The above 6.4 metres vessel was designed for use with a 7.5 metres “emergency and auxiliary sail”. In the late 1980s FAO donated a sail/motor canoe to a community for sail demonstration purposes. In the early 1990s FAO supplied a skiff emergency sail rig to the Navy so that it could be demonstrated to remote villages during patrols. With the exception of traditional sailing craft in an isolated part of the country (southern Lau) and yachts, there is little, if any, use of sail by fishing operations in Fiji.

There are a few naval architects in Fiji. In the past they have produced designs for tuna vessels (pole/line, longline) which have been built in one large and a few small boatyards around Suva. For small fishing vessels, there are three fibreglass and two aluminium boatbuilders located in the Suva area. A few small yards around the country produce wooden flat-bottom skiffs.

The vast majority of new boats in the country are outboards-powered fibreglass skiffs of about seven metres in length. According to the Navy, these vessels are responsible for most of the SAR incidents. Because it is likely that their use in Fiji will continue to expand, sea safety in Fiji will be closely associated with these vessels in the future. In this regard, two important issues are:

- the legal safety requirements for these vessels (Small Craft Code, Section 8.5 above) are so inappropriate that they are meaningless and universally ignored;
- there are major concerns over the design and quality of construction of fibreglass (and to a lesser extent aluminium) skiffs.

Recently FIMSA has brought together the fibreglass/aluminium boatbuilders of Fiji in an attempt to obtain their input prior to establishing mandatory skiff construction standards. It appears that these discussions could benefit considerably from global experience in attempts to improve skiff safety through construction standards. An FAO contribution in this area could have considerable impact in many of the Pacific Island countries outside Fiji, as these skiffs are quite numerous in many parts of the region.

8.7 Observations

The major issues in improving sea safety in Fiji appear to be:

- Enforcement at sea of safety regulations.
- Realistic sea safety regulations for small fishing boats.
- Getting the awareness message to isolated villages.

Some sea safety lessons-learned in Fiji:

- A major sea disaster may be required to generate political will to improve sea safety.
- For the type of small fishing vessels used in Fiji sea safety awareness programmes are likely to have greater impact than enforcement of inappropriate legislation.
- Radio appears to offer the greatest opportunity for sensitizing remote villages to sea safety issues, and is certainly better than dependence on non-existent distribution channels of some of the government agencies involved in sea safety.
- As the use of fibreglass skiffs is likely to grow in Fiji and the region, more attention should be focused on appropriate construction standards.

9. Sea safety in Kiribati¹⁴

9.1 General

Kiribati is an archipelagic nation comprising 33 islands with a total land area of only 810 km² but with a surrounding EEZ of about 3.5 million km² that includes some of the most productive tuna fishing grounds in the Pacific. All the islands are of coralline origin and are surrounded by fringing or barrier coral reefs. The country is divided into three widely separated island groups - the Gilbert Group in the west, the Phoenix Group in the centre, and the Line Islands in the east. The distance between the eastern and western extremes of the EEZ is over 4 500 km. Tarawa Atoll is the location of the capital and several urban areas.

About 90 000 people live in Kiribati. Preston (2000) estimated that 1 131 people are employed in commercial harvesting and 20 000 employed in subsistence fishing. In recent years Kiribati has received around US\$20 million each year from licensing foreign fishing vessels. In early 2001 a total of about 350 foreign fishing vessels were licensed to fish in Kiribati waters. Two longliners and one purse seiner are based and/or registered in Kiribati.

Subsistence and small-scale artisanal fishing is conducted throughout the islands, from traditional canoes driven by sail or paddle, from plywood canoes powered by outboard motor and from larger outboard-powered skiffs. Fishing is by bottom handlining, trolling, pole-and-line fishing, midwater handlining, spearing, trapping, netting and reef gleaning. Small-scale commercial fishing is concentrated around Tarawa where a sizeable population, some ice and cold store facilities, and a cash-oriented economy create better market conditions. Household survey data from 1995 shows a total of 565 skiffs and 3 968 canoes in the country. Of the skiffs, 407 (72 percent) were based in Tarawa. Savins (2001) states that (a) there are over 200 troll boats presently active on Tarawa which employ 300 fishers full time and 300 fishers part time.

Features of Kiribati which are especially important in sea safety include:

- a large amount of ocean fishing in skiffs;
- great dependence on outboard engines and the fact that most boats carry a single engine;
- the low-lying nature of the islands limiting visibility of islands to about ten nautical miles.

A typical sea accident involves a Tarawa-based skiff trolling for tuna at a considerable distance from land and experiencing mechanical or fuel problems and drifting days or months until recovered by a foreign fishing vessel.

9.2 Fisheries management and sea safety

The broad objectives of fisheries management in Kiribati are articulated in the annual reports of the Fisheries Division. Fisheries Division (2000) states the goals are:

- expansion of commercial utilization of inshore marine and fisheries resources, without disruption of artisanal and subsistence use;
- rational utilization of marine and fisheries resources on a sustainable basis;
- maximization of optimal returns from the utilization of offshore marine and fisheries resources.

Other indications of fisheries management objectives are located in legislation and in development plans:

- In Kiribati's Fisheries Act there is no direct reference to management objectives, but some indication of expected outcomes is inherent in the first substantive section of the Act: "The Minister may take such measures as he shall see fit to promote the development of fishing and fisheries in Kiribati to ensure that the fisheries resources of Kiribati are exploited to the full for the benefit of Kiribati".

¹⁴ Most of the information in this section was kindly provided by Mike Savins, a Tarawa-based boatbuilder, fish processor, and consultant.

- The National Development Strategy 2000–2003 has a section on fisheries. It states that the policies and strategies in the sector are: (1) Promote private sector production and marketing of marine products, (2) Identify specific marine commodities having highest commercial feasibility, (3) Accord high priority to selected commodities that can be produced and marketed by smallholders in the outer islands, (4) Formulate a strategy for promoting fish transshipment by foreign vessels and for achieving greater utilization of onshore facilities by these vessels, (5) Complete development plan for the cultured pearl industry, and (6) Complete development plan for the milkfish industry.

From the above, the safety of fishers does not appear to be a prominent fisheries management objective.

With respect to specific management measures in the inshore areas, the national fisheries legislation stipulates:

- the taking of fish in any traditional fishing area except by members of the area's traditional owners;
- prohibition of destructive fishing;
- areas closed to fishing and size restrictions on lobsters;
- Christmas Island has several "no kill" zones in the lagoon to protect the bone fish fly fishing industry;
- a ban on the use of underwater breathing apparatus for harvesting sea cucumber.

In addition to management intervention specified by the fisheries legislation, there are several other types of measures:

- North Tarawa has a no-fishing marine sanctuary at Naa, the very northern end of Tarawa, under the Ministry of Environment and Social Development.
- The most southern islands of Kiribati Arorae and Tamana and to a limited effect Nikunau have local Island by-laws that prohibit the use of outboard motors, gill nets and kerosene pressure lamps for fishing. These rules stem from a belief that this gear will scare fish from their Islands.
- Island by-laws and local council by-laws on several islands restricting fishing in various inshore lagoon areas or sometimes specific outer reefs

With respect to offshore fisheries management, the primary objective appears to be generation of government revenue and the main measure to achieve this objective is to license foreign fishing vessels for a fee. In early 2001 a total of about 350 foreign fishing vessels were licensed to fish in Kiribati waters. An important restriction is that Kiribati licensing policy prohibits foreign tuna fishing activity within 12 nautical miles of any island in Kiribati.

There are several effects of the above fisheries management on sea safety.

- Some of the restrictive inshore measures (closed areas, etc.) may have the effect of encouraging more offshore fishing.
- On the southern reef islands (Arorae, Tamana, Nikunau) fishers generally do not drift away as paddling is the source of propulsion and fishing effort is generally near shore.
- There is the contention that discarded fish from foreign vessels transshipping in Tarawa have kept fishers at home due to the local market being flooded with low value fish. On the other hand, when there are no discarded fish, competition is high and fishers are encouraged by market forces to fish in rough weather.
- The large number of foreign fishing vessels in the Kiribati zone can provide an opportunity for drifting fishers to be rescued. According to the Marine Division, about 25 percent of all missing boats are recovered by foreign vessels. There are, however, reports that foreign fishing boats sometimes refuse to provide assistance to drifting fishers.

9.3 Safety programmes

Sea Safety is an ongoing feature of the Fisheries Division's training programme, especially that dealing with outboard engines. An outboard mechanical training workshop has been established at the Fisheries Division, funded by Japan's Overseas Fisheries Cooperation Foundation (OFCF). Most of the participants are island council mechanics and, after training, they pass on their skills through similar workshops on their home island. Because outboard motor breakdown is the most common cause of problems at sea, an outboard motor maintenance and repair manual has been produced in the Kiribati language.

Other safety-related initiatives of the Fisheries Division include:

- the testing of VMS transponders;
- sponsorship of a radio programme on the national radio every two weeks on various fisheries topics (about twice per year the subject is safety at sea; Radio Kiribati reaches almost all Kiribati residents);
- establishment of a HF radio repeater at Betio on Tarawa, and plans to set another in Abaiang and Maiana to provide coverage for fishers on all three islands;
- equipping the two government longliners with safety gear as per SPC's recommendations;

At the request of the Fisheries Division, SPC is producing safety at sea posters in the Kiribati language. Almost every fuel station on Tarawa has displayed posters and they have been sent to all island councils and outer island fisheries assistants. A local video company has been contracted to translate the SPC safety at sea video into the Kiribati language. Earlier the English version was sent to every Island council in Kiribati for public showing. The video was also made available at video stores in Tarawa for loaning at no charge. A Fisheries assistant on Marekei reported that the video was widely viewed and well received on the Island.

In the early 1990s the FAO Regional Fisheries Support Programme designed, manufactured and promoted a simple emergency sail rig for small vessels. In Tarawa there were advertisements, meetings, and demonstrations, but attendance was poor. One boat was fitted with the rig in Bairiki and two in Betio. It is believed, that fishers only used the rigs for a limited time then left them at home. A Senior Fisheries officer has commented that the emergency sail rigs are too cumbersome and will always be left at home. He therefore believes that radios are more appropriate for safety than sails.

The Tarawa Technical Institute (TTI) has conducted several outboard motor maintenance and repair workshops, targeting outer island participants. In 1988 TTI conducted evening classes for fishers. The course covered basic safety at sea issues and basic navigation. The course was popular, each course ran for two weeks, and about 12 courses were held over a one-year period. Every fisher who attended was presented with a compass at the end of the course.

The Marine Division has carried out training for captains to obtain a lagoon licence which cover the trip to Abaiang, where the more regular passenger ferries operate. The Marine Division through the Marine Training School has upgraded all grade 4 and grade 5 captains and engineers, while all grades 3, 2 and 1 have been upgraded in Fiji, Australia or New Zealand.

Various donor initiatives in fisheries development have contained safety components. The Outer Island Fisheries Project (first UK (1985–1992), then Japan (1992–present) has insisted on safety measures for its fishing craft, including small sea gull engines and emergency sail rigs. In the UNDP/FAO Artisanal Boatbuilding Project (1982 to 1989) the main priority was producing safer commercial fishing craft.

The effectiveness of the above initiatives effective is not always easy to judge. Some observations are:

- If efficient sailing rigs are fitted to new boats they are almost always carried on boats in the outer islands where fish prices are low.

- If an emergency sail rig can serve as a combined sun/rain cover, it is usually carried. In addition, if the rig's rudder and leeboard are an actual floor section they are usually carried.
- The FAO canoes with emergency foam floatation and sails have saved lives. This is evidenced by several drift voyages in which the floatation held the victims afloat and the sail allowed the collection of drinking water.
- The outboard motor training has helped with the more basic repair and maintenance of outboard motors. This is evidenced by the fact that the majority of fishers reported missing, turn up within three days, often because they are able to repair engines at sea.
- Most full-time commercial fishers of Tarawa carry outboard motor tools, many carry a compass and several carry emergency flares and GPS units. This could be seen to be partly from the various safety training programmes and safety at sea publicity.

Some safety initiatives may have had little or adverse effect on fisher's safety. The auxiliary outboard motors supplied by the UK Outer Island Project mostly ended up on relative's traditional canoes, as these engines are ideal on traditional canoes. Many of the emergency sail rigs are left at home. The HF radio repeaters are only of use if fishers can obtain radios at a cost perceived to be reasonable. The VMS system may prove too costly.

There are several options for improving sea safety in Kiribati. Facilitating access to safety gear, enhancement of boatbuilding skills, safety awareness, and regulations covering sea safety appear to be the most important.

Fishers interviewed stated they were willing to buy safety equipment if available. The Fisheries Division indicates they would like to sell safety equipment for fishing boats at cost price, under the same revolving fund they currently run for fishing equipment. Another possibility is to make available a low cost sea safety kit and allow fishers to purchase the kit on credit.

Local boatbuilding skills could make a major contribution to sea safety in Kiribati. Although the Kiribati vessel designs are generally seaworthy, the standard of construction is often very poor, leading to problems at sea. Presently, there are only a few competent boatbuilders. There is a need to train young school leavers how to build boats correctly to eliminate the types of sea accidents caused by poor construction. The same boatbuilding skills are also in demand for repairing existing craft, which could also have a positive effect on safety.

There is a need to educate fishers on every island concerning the need for, and use of, safety gear. The use of radio (see section above) could play an important role.

There is support for mandatory safety requirements on fishing vessels. Some people feel that training about safety at sea should be compulsory before anyone is allowed to take a boat to sea. The Director of Marine in the Ministry of Communications believes that there must be compulsory inspection of fishing boats.

SPC staff have recently visited Kiribati and commented on improvements to sea safety. The report of the mission (Chapman, 2003) made three suggestions concerning safety:

- that the Fisheries Division encourage local small-scale vessel operators and future medium-scale tuna longline fishers to purchase sea safety equipment for their vessel, with the government assisting with the provision of a soft loan for the initial purchase of the gear;
- that the Fisheries Division develop or request materials from SPC, and run an awareness campaign on sea safety and the use of safety equipment, for all small-scale fishers;
- that the Fisheries Division work with the Marine Department, to ensure appropriate regulations are developed and implemented for sea safety requirements on small-scale fishing vessels.

9.4 Data recording

In Kiribati the authority responsible for sea safety data recording is the Registrar of Seamen, Marine Division, and Ministry of Communications. Missing fishers are reported to the Marine Division, usually by their families. This report is placed in a general file.

Upon receiving a report, the Marine Division will first phone all nearby islands and establish if the boat has turned up at an alternative island. If not, a full-scale search is mounted immediately. The Marine Division may charter aircraft, inter-island vessels, or request the police patrol boat to assist, with all expenses covered by the Marine Division. The Marine Division also advise Fisheries Division Licensing Unit, who then requests any distant water vessels in the area to keep a look out for the missing craft.

According to staff of the Marine Division, to compile a summary of sea accidents for past years would require a search through many files, some of which may have been lost. For the past two years, the missing craft data can be summarized as:

	2001	2002
Missing craft	42	22
Returned safely ashore	27	19
Rescued	13	3
Disappeared	2	0

The Marine Division indicates that in a typical year there would be no less than 40 missing vessels reported, of which 25 would be found within three days. Three or four are likely to be rescued later locally, and around ten are found by distant water fishing vessels or commercial cargo vessels.

The missing craft information for 2001 and 2002 indicates a major difference between the years. It is likely that 2001 could be considered a normal year, while 2002 shows the effect of reduced skiff fishing due to a market glut caused by transshipping vessels discarding fish in Tarawa. A Tarawa fish exporter stated that "half the local troll fleet was out of business for almost all of 2002".

Data analysis and collection could be improved by the Marine Division having a separate file for missing vessels. Reports should include the reported details as well as information obtained from a debriefing of the victims. An annual summary should be produced and include such information as fishers involved, reason for distress, location of recovery, and sighted vessels which did not offer assistance.

9.5 Legislation

The basic fisheries law is the Fisheries Act (Cap.33). Although the word "safety" does not appear in the Act, there is a stipulation that all local fishing vessels require a licence. The Act further states that a licence is not to be issued "unless there is subsisting a valid unexpired certificate of seaworthiness issued in respect of the fishing vessel". However a "fishing vessel" is specifically defined to be "any vessel used or adapted for use for fishing commercially, and includes support vessels and craft, and helicopters and light aircraft used in fishing operations, but does not include a sailing boat or paddling canoe of native design or a boat, punt or barge having an overall length of less than seven metres, whether powered by an engine or not".

Another relevant feature of the Fisheries Act is that it allows the President to make regulations for 26 named purposes, none of which concerns sea safety.

In summary, it appears that it is not possible to address sea safety for small vessels through the licensing and regulation provisions of the present Fisheries Act. For fishing vessels above seven metres, the Act addresses only seaworthiness.

The Shipping Act 1990 and subsidiary legislation is applicable to only commercial cargo/passenger vessels above ten metres. A report on shipping legislation in Kiribati (SPC 2001) states “the attitude of fishing companies towards STCW is that STCW does not affect fishing vessels and therefore officers on board fishing vessels do not require further training or upgrading to STCW requirements”.

The Director of Marine has expressed the belief that fishing vessels should come under the same regulations as commercial cargo and passenger craft. This sentiment appears reasonable but consideration should also be given to regulating safety on the size of vessel most often involved in sea accidents.

9.6 Boatbuilding and vessel design

In the 1980s FAO produced designs for ten different vessels, from a one-man paddling canoe to an 11 metres transport canoe. Individuals involved in that work have subsequently produced six additional designs. Local boatbuilders have continually developed their own designs of planing skiffs and a local version the FAO single outrigger canoe. Although the skiff designs appear good and three or four boatbuilders build to a safe standard, there are some problems, especially with the lack of foam for emergency floatation.

An aluminium boatyard in Fiji has been exporting four to six metres aluminium boat kits to the Betio Shipyard in Kiribati where they are put together with welding and rivets. These vessels are an appropriate design and have emergency foam floatation. The same company has recently introduced a slightly larger seven metres skiff with a mechanized monofilament longline drum and associated gear.

Other building design developments include:

- The Betio shipyard has been modifying FAO designs for passenger craft. Because the superstructure is large, much of the carrying capacity is lost.
- As there are hundreds of non-operational busses with good engines, there is presently interest in adapting second-hand Toyota min-bus diesel engines for use on boats.
- A ten metres catamaran has been modified into an 11.6 metres proa and equipped with a 12hp direct-drive air-cooled diesel.
- A Kiribati-based American boatbuilder has designed several boats himself.

Generally these initiatives have improved safety as the designs are mostly good. One difficulty is that boatbuilders with little experience are producing some dangerous boats, especially small skiffs and plywood single outrigger canoes.

Another problem is with the surveyors selected by the Marine Division. Although the people appointed may have some appropriate experience, they may not be fully qualified. This can result in the surveyors being mainly interested in the vessel safety equipment, rather than the more complex issues of vessel design or quality of workmanship.

With respect to the use of sail, this practice is more prevalent today in Kiribati than in any other Pacific Island country. In addition to the traditional sailing canoe, the outer islands have continued to utilize sail on the introduced FAO-designed vessels to reduce operating costs; sometimes there is no alternative due to lack of availability of fuel. Attempts at introducing emergency sail rigs have not been especially successful.

With respect to naval architecture work, there is a need to introduce criteria for proper construction. These specifications should be easy for an inspecting officer to understand and follow. Scantlings should be specified for various sized vessels, along with the minimum amount of safety equipment for each size category of vessel.

9.7 Observations

The major issues in improving sea safety in Kiribati appear to be:

- coverage of fishing vessels under seven metres by sea safety legislation, including provision for safety equipment, design criteria, and vessel inspection;
- subsequent enforcement of any such legislation;
- the need for an on-going safety awareness programme on every island.

Some sea safety lessons-learned in Kiribati:

- Most people that go missing are inexperienced.
- Full time commercial fishers in Tarawa are seen to be more aware of safety at sea.
- Emergency sail rigs will always be left at home if they have no other purpose than safety. If the sail is used for sun and rain cover it will usually be carried, if the rudder and leeboard are a section of the floor, they will usually be carried.
- Oars or spars must be useful in the fishing operation if they are to be carried.
- Emergency foam floatation will always be removed if it is not securely fastened.
- A small auxiliary engine will generally end up on another boat. A second engine is expensive. but because dirty fuel and running out of fuel are common, it is no guarantee of safety.

10. Features of the country sea safety information

The sea safety surveys in the five countries covered in the present study yielded a large amount of information on the five main topics covered: the relation of fisheries management to sea safety, safety programmes, data recording, legislation, and boatbuilding and vessel design. When each of these topics is viewed across the five countries, some interesting patterns emerge. These features and some associated considerations are covered in the sections below.

10.1 The relation of fisheries management to sea safety

The concept of including sea safety as a specific objective of fisheries management is not common in the countries of the survey. In several countries, safety appears to be considered when formulating management interventions, but the idea that saving lives of fishers could be one of the stated objectives of government management intervention does not occur in the five countries.

There are several reasons for this. In some countries there is the view that the primary objectives of fisheries management are limited to biological and economic issues. This belief is shown in the tuna management plan of one country, which states that the plan “discusses options for the management of the tuna fishery and makes recommendations intended to enhance its sustainability and profitability. Infrastructure, safety issues, catch handling, and training for the industry are addressed in separate documents....”

An associated issue is the imprecise “fuzziness” of term “fisheries management”. Many fishery officials in the Pacific Islands region tend to equate fisheries management with “administration of fisheries”. The concept that fisheries management is to be oriented to attaining specific objectives is not always practiced. In this situation, the potentially beneficial relationship between fisheries management and safety can easily be overlooked.

Another reason why the link between fisheries management and sea safety is not strong is the nature of the fisheries legislation in some countries. The fisheries laws of several countries are restricted to (as stated in one country’s law) “regulating matters relating to the conservation, protection and maintenance of a stock of fish”. Put more crudely, the fisheries laws of some countries are more about the safety of fish than the safety of fishers.

An important point is that during the course of the present study, there appeared to be little objection on the part of government fisheries officials to including safety in fisheries management. On the contrary, several fisheries managers were enthusiastic about the idea when discussed.

There is also another reason for associating sea safety with fisheries management. In the future, as the fisheries of Pacific Island countries become more fully exploited, it is likely that the functions of the government fisheries agencies of the region will evolve so that there is greater emphasis on management, while the development functions are reduced. This being the case, it is important to ensure that safety be considered as an objective of management so it gains more attention, rather than being reduced along with development-oriented activities.

To ensure that sea safety is included in fisheries management, a number of measures should be considered:

- raising awareness of government fisheries officials that safety is a legitimate and desirable objective of fisheries management intervention;
- sensitizing those individuals responsible for the legislation (and those providing regional advice on fisheries legislation) that the scope of the fisheries laws/regulations should allow coverage of safety issues;
- because it is the tuna fisheries that are linked strongest to sea safety in most Pacific Island countries, it is in the area of tuna fisheries management where attention should be focused.

10.2 Safety programmes

The common types of initiatives in fisheries-oriented sea safety in the Pacific islands in the past decade have been:

- the SPC regional safety awareness programme;
- radio awareness programmes by various government agencies;
- provision of subsidized safety gear, usually sponsored by donors;
- revision of national shipping legislation to include fishing vessels;
- institutional safety courses as required by revised legislation;
- campaigns of enforcement of sea safety legislation;
- vessel communication upgrades.

These various programmes have ranged from discrete donor projects to regulatory functions of government agencies. The actual measures being promoted by the programmes can be very different; they are largely oriented to the prevention of accidents, but also include self-help when in distress, and search/rescue efficiency.

Some observations on the major programmes are:

- Many of the government fisheries agencies are not especially active in sea safety work. In several countries, the main safety activity of the fisheries agency is distribution of the SPC safety materials.
- The FAO 1991 study stressed the value of safety awareness programmes. This assertion has had a major influence in the type of sea safety programmes during the following decade.
- Most of the major national programmes in sea safety were catalysed by disasters or multiple disasters.

There are several different dichotomies to fisheries sea safety programmes, with the main ones being (a) small craft versus semi-industrial vessels (mainly tuna longliners), and (b) urban-based vessels and those from remote areas. Accordingly, the three main targets for domestic safety at sea work could be thought of as:

	Urban	Remote
Local longliners	1	XXXX
Small vessels	2	3

Appropriate safety-improvement initiatives can be very different for the three target categories. This applies to the value of safety legislation for improving safety, the type of awareness campaign needed, and striking the correct balance between legislation and awareness. Some shipping-oriented sea safety programmes in the past has often not been very sensitive to category 2 and especially category 3. The applicability of fisheries-oriented sea safety programmes from other regions of the world and from developed countries in the Pacific to category 3 has been a problem (e.g. the linking of safety to non-existent requirements for a licence). In this regard, several considerations are important:

- most countries in the region have a substantial proportion of vessels in category 3;
- the limited data indicates that a disproportionate amount of accidents are from this category;
- of the three categories of vessels, the operators of category three vessels are the least able to afford safety gear and the least able to understand awareness material in English or French;
- the distinction between a fishing vessel and a vessel used for other purposes is often blurred in category 3: "fishing vessel one day, transport vessel the next".

One of major lessons-learned in sea safety programmes is that it is very difficult to determine their effectiveness. The SPC is especially sensitive to this problem. The present study used perceptions of fishers, fleet operators, and government officials in the five countries visited to gain insight on the value of the various initiatives. To learn about the effectiveness of those programmes that involved awareness raising, efforts were made to collect information on the basic prerequisite: if the target audience is "aware of the awareness programme". It also should be noted that there may be major differences between countries in regard to effectiveness of programmes; what works well in a relatively affluent high island country, may not be effective for an equatorial atoll least-developed country.

Despite the difficulty in assessing effectiveness, some observations and comments can be made. In general, the survey findings in the five countries suggest that the following are generally successful:

- appropriate small-vessel legislation backed up by "big stick" enforcement for urban-based commercial vessels;
- radio programmes and extension visits for remote locations;
- video for those communities with access to video facilities;
- "no survey, no licence" for areas/fleet strictly controlled by licensing;
- institutional safety courses for the semi-industrial fleet.

Although other types of safety programmes could easily be successful (e.g. promotion of vessel communication systems), it was not possible to gain insight into their effectiveness during the short period of the survey.

In general, there is some sentiment on the part of officials and industry participants in Samoa, Fiji, and Kiribati that small-scale fishers are either more conscious of sea safety issues and/or are carrying more safety gear than in the past. Individuals in those countries tended to believe that continual awareness programmes are responsible, or at least contribute to the success. Any improvement in Tonga and Tuvalu was less evident in the present study.

The results of some initiatives appear disappointing:

- the promotion of emergency sail rigs and auxiliary sail rigs in areas where there is no continuing tradition of sail use has not been successful;
- providing subsidies for safety gear without a long-term subsidy strategy;

- the sale of safety gear through government fishery agencies.

SPC sea safety programmes and consideration on their effectiveness are discussed in a separate section below. Thoughts on important areas for future interventions are given in the conclusions to this report.

10.3 Data recording

The recording of data on sea safety incidents was a topic investigated in each of the five countries visited during the survey. An examination of the various procedures allows the following observations:

- Most of the government fisheries agencies do not have major involvement in recording data on accidents. It is the maritime administrations and/or the police that initially receive the accident reports and record/store information.
- In most countries, the initial reports are actioned, and subsequently filed. Detailed accident data is therefore likely to be available in each country from files. There is often the contention that summaries are given in the annual reports of the agencies, which is often not the case.
- In most countries visited not much importance is attached to producing annual sea accident summaries with sufficient detail so as to be useful for sea safety programme planning.
- In countries where sea accident summaries are available, they are frequently not exclusive to fishing craft. Incidents involving passenger vessels and yachts are common and on several national accident summaries it is not obvious which incidents relate to fishing operations.
- Many of the available summaries do not represent all sea safety incidents, but rather lists of operations that the recording agency is involved in.
- It was not evident during the surveys of the five countries that any follow-up action was carried out such as debriefing the victims, obtaining detailed information on causes of the incident concerned, or correction of the data for victims who turned up months later.

As a result of these difficulties, for most of the countries in the survey the readily available data on sea accidents falls short of its potential in promoting sea safety. That is, focusing future safety programmes, generating political will for measures to prevent accidents (e.g. awareness of lives lost or money spent on SAR), and judging the effectiveness of past sea safety programmes.

Value of data for focusing safety projects seems to be underestimated in many countries. In Samoa where there is a relatively good system in place, the summary information on incidents of sea safety permits identification of accident-prone situations with respect to vessels, areas, and seasons. This is consistent with the observation in a global study on fisheries sea safety (Peturdottir et al. 2001) that stated “collecting data on accidents is important for the planning and prioritisation of preventative measures”.

There is much room for improvement of data collection and analysis. For those countries which do not summarize annual data into a useful form, it may be possible to generate interest in doing so by examples from other countries with functional systems. For those countries that presently produce annual summaries, the utility of the data for the purpose of sea safety could be improved by adding additional details to the summaries: type/size vessel, owner, base of vessel, cause of incident, cost of SAR.

As most countries of the Pacific Islands region have Australian-funded Maritime Surveillance Advisers, they could play an important role in promoting the above improvements in data collection and analysis.

10.4 Legislation

Information on the sea safety requirements in both the national fisheries legislation and the shipping legislation is given in the country sections of this report.

On the regional level, SPC's Regional Maritime Programme has developed a number of generic shipping regulations for the region which can be tailored to an individual country's unique needs. They propose doing the same for fishing vessels. According to the staff of the Maritime Programme, it will be quite some time before this initiative occurs.

One of the major outstanding issues in national sea safety legislation is the coverage of small fishing boats. These are the vessels that are associated with most of the sea accidents in the region, but they are excluded from both the fisheries and shipping legislation in most countries as shown in the following table:

Country	Safety aspects of fisheries legislation	Safety aspects of shipping legislation
Tuvalu	Does not cover vessels under seven metres	Does not cover fishing vessels
Tonga	Does not cover fishing vessels under six metres ¹⁵ ; requirements for fishing vessels over six metres usually enforced for only company vessels	Does not cover fishing vessels under 8 metres
Samoa	Covers all commercial vessels; requires safety certificate under shipping legislation	The Shipping (Small Vessels) Regulations 1999 cover all vessels that are less than 15 metres in length
Fiji	Does not cover sea safety	Fiji Small Craft Code covers all commercial vessels under ten metres, but is inappropriate for small fishing vessels
Kiribati	Does not apply to vessels under seven metres	Does not apply to fishing vessels

In the survey of the five countries, only one country was found to have appropriate safety legislation for small craft, while other countries either excluded small fishing vessels or had inappropriate rules. Applying the lessons of the past, any formulation of mandatory sea safety requirements for small fishing vessels should:

- be done with substantial technical input from individuals with thorough knowledge of these vessels and the fisheries in which they participate;
- be sensitive to the practicalities of enforcement in remote locations;
- be conscious that many problems of sea safety cannot be addressed through legislation;
- aim to achieve an appropriate balance between legislation and awareness for improving sea safety;
- be sensitive of the difficulties in political acceptance of new controls on small-scale fishing activity;
- be aware of the difficulties concerning applicability of generic regional legislation.

To accommodate the above, some form of multi-disciplinary regional meeting may prove useful. Such a gathering could use the collective experience of individuals from fields as law, fishing, and naval architecture to suggest to national authorities appropriate regulatory measures for small fishing vessels.

Enforcement of legislation is a critically important issue in sea safety. The results of this survey suggest that for a country to be serious about improving the sea safety situation, that country must be serious about enforcing its legislation. This concept, however, must be balanced with the reality that there are major enforcement problems. Two countries in the survey have few enforcement problems, simply because there are virtually no safety regulations applicable to the vast majority of their fishing fleet. The enforcement problems in the other three countries of the survey show great

¹⁵ New legislation is pending.

inter-country differences. The one common problem appears to be the difficulty of enforcement in remote areas. This problem is likely to be even greater in some of the Pacific Island countries not covered by the present survey.

Enforcement of sea safety regulations in remote locations may be an intractable problem. It could easily be that improvement of safety at sea in those areas could best be addressed by other means, especially awareness programmes. Further work on this subject may benefit from expertise outside the fisheries and shipping sectors, such as individuals experienced in social aspects of community development in the Pacific Islands region.

Given the great differences in enforcement conditions in the five countries of the survey, there may be little to be offered with respect to suggestions for improvement that is common to several countries. In this situation, two points should be considered:

- In Section 10.2 above which comments on successful sea safety initiatives, there were two schemes concerning enforcement that appear to work well: (1) Appropriate small-vessel legislation backed up by “big stick” enforcement for urban-based commercial vessels, and (2) A “No survey, no licence” policy for areas/fleet strictly controlled by licensing.
- In cases where there is especially diligent enforcement, political will to improve sea safety seems to be responsible for cutting through the cultural, administrative, and practical constraints to improving enforcement. The subject of political will is covered in Section 11.1.

10.5 Boatbuilding and vessel design

The link between boatbuilding, vessel design, and sea safety is closely tied to FAO’s past work in the Pacific islands. In the 1980s much FAO attention in the region’s fisheries sector was focused on naval architecture and support to building boats. A 1990 FAO publication stated that FAO had produced plans for 30 different vessels, including those designed specifically for Cook Islands, Fiji, Kiribati, Niue, PAPUA NEW GUINEA, Samoa, Solomons, Tonga, and Vanuatu. FAO has established, assisted, or enhanced boatyards in all those countries plus Tuvalu.

Presently there is very little FAO activity in the Pacific islands dealing with designing/building boats. An important issue is whether this field with respect to FAO is (a) a neglected area, (b) a situation in which local capacity has been built up to the point that FAO interventions are not required, or (c) conditions have evolved so that it is more efficient to import boats produced where production costs are cheaper.

There is certainly room for speculation and there is obviously great difference between countries. The survey results in several countries suggest that many Pacific Island countries are in a similar situation to that of Tonga. Paraphrasing from Section 6.6, the situation is:

The reality is that boatbuilding is expensive in the country and in the age of globalization, the market forces and preferences of small-scale fishers favour the use of mass produced skiffs from overseas. With respect to larger vessels, the fishing companies much prefer to import new or used vessels from overseas where construction is more efficient. Given this boatbuilding situation, the major issue in Tonga in the interface between naval architecture and sea safety appears to be measures to assure that the imported vessels are safe. This may range from establishing import standards for mass-produced skiffs to identification of features important for the safety inspections of longliners from Asia.

In a smaller number of countries, probably limited to Kiribati and Tuvalu, the situation with respect to safety/boatbuilding is quite different. There are a number of small boatyards building mainly wooden fishing vessels. It has been pointed out that improvements in construction techniques used by the mainly indigenous builders could lead to safer vessels and a reduction of accidents at sea.

An important point is that it is unlikely that limited donor interventions in the fields of vessel design will reverse trends that are fuelled by market forces, preferences, government policies outside the fisheries sector (e.g. lowering of import duties, reduced government participation in commercial activities), and changing lifestyles. Rather than attempting to alter the evolution of vessel design in

the region to improve safety, it may be more productive to “go with the flow” and promote safety features and construction standards for the types of vessels that are now common and are likely to grow more common in the future.

This concept is especially applicable to fibreglass skiffs. Although statistics are lacking, it is probable that most of the new small-scale fishing vessels in the Pacific islands are either imported or domestically-manufactured fibreglass skiffs. Paraphrasing from Section 8.6 of this report on Fiji vessel designs:

The vast majority of new boats in the country are outboard-powered fibreglass skiffs of about seven metres in length. According to the Navy, these vessels are responsible for most of the SAR incidents. Because it is likely that their use in Fiji will continue to expand, sea safety in the country will be closely associated with these vessels in the future, but there are major concerns over the design and quality of construction of these fibreglass skiffs.

Quite simply, the safety aspects of fibreglass skiffs cannot be ignored. Depending on the country concerned, improved standards of construction and mandatory safety features of fibreglass skiffs would focus on either domestic construction (e.g. Fiji, Papua New Guinea, Solomon Islands) or import requirements (eg. USA-affiliated Micronesian countries). Alternatively, there is the possibility of working directly with the major overseas manufacturers. In any case, it appears that attempts to enhance the safety of these craft could benefit considerably from appropriate global experience in making safety improvements to fibreglass skiffs.

The issues in the interface between naval architecture and safety for larger vessels are obviously quite different in each country and dependent on the types of vessels involved. The vast majority of fishing vessels larger than 15 m based in Pacific Island countries are associated with tuna fishing. A recent report by the Forum Fisheries Agency (Gillett 2003) gives information on locally-based tuna vessels in the independent countries of the region:

With respect to sea safety, an important point is that, with the exception of Samoa, almost all of the above vessels are imported, mostly from Asia. The lives of nearly 3 000 Pacific Island crew are to some degree dependent on effective inspection of vessels, the design/construction of which can be quite different from those common in the country of operation and where any statutory safety inspection is carried out. This being the case, global experience in design faults, construction problems, and structural-related sea disasters accidents on vessels from Asia, oriented towards improving tuna vessel safety inspections, may produce significant benefits to the countries of the region where there are less experienced marine surveyors.

	Active locally-based tuna vessels	Number of Pacific Island crew
Solomon Is.	12 P/L, 2 P/S, 8 L/L	464
Papua New Guinea	40 L/L 24 P/S	460
Fiji	96 L/L, 1 P/L	893
FSM	34 L/L, 8 P/S	89
Samoa	153 L/L	674
Tonga	26 L/L	161
Tuvalu	0	0
Vanuatu	0	0
Marshall Is.	54 L/L, 5 P/S	5
Palau	71 L/L, 1 P/L	1
Nauru	1 L/L	5
Niue	0	0
Kiribati	2 L/L, 1 P/S	39
Cook Is.	10 L/L	50
Total	14 P/L, 40 P/S, 495 L/L	2 841

P/L = Pole-and line vessel; P/S = Purse seiner; L/L = Longliner

11. Other important issues in sea safety in the Pacific islands

11.1 Political will

In several countries the lack of political will to improve sea safety at sea is a major difficulty. When political will is strong, the attention of government departments is high, there is interest in the formulation of new safety initiatives, and enforcement of safety requirements is diligent.

Unfortunately, the generation of political will is often tied to a major sea disaster. This includes government interest in sea safety after:

- the loss of ten lives in the sinking of the longliner Wasawasa in Fiji in March 1997;
- the loss of 17 lives on catamaran craft in Samoa in 1997;
- the loss of 6 lives in the sinking of a bottom fishing boat in Tonga in February 2002.

There are less tragic mechanisms to generate political will. Although the subject requires further exploration, there are indications that keeping track of lives lost at sea and the expense of government search/rescue operations and subsequent publicity of this information can capture government interest to move on sea safety issues.

Most of the five countries in this survey are unable to provide a listing of the number of lives lost in sea accidents each year for the past decade. The amount of government money spent on search and rescue is readily available in only one country¹⁶. In this situation it is easy to see why the level of political for promoting sea safety is low.

As a prerequisite to attracting more government attention to efforts to improve sea safety, it is recommended that additional attention be focused on keeping records of sea accidents and the associated search/rescue expense. This is in addition to the value of such records for improving the effectiveness of safety programmes (Section 10.3).

11.2 The effectiveness of the SPC sea safety awareness initiatives

In the course of planning for the present sea safety survey, a meeting was held with staff responsible for SPC's sea safety awareness work¹⁷. During the discussions it was learned that one important aspect of the project is the difficulty in determining its effectiveness; in other words, whether the various materials distributed by the Fisheries Training Section have saved any lives. Accordingly, some effort was made to investigate this question.

The SPC materials which have been distributed are:

- four posters on safety at sea;
- logo stickers "Think Safety at Sea";
- A4-size stickers "Small Boat Safety Check-list";
- laminated cards "Small Boat Safety Check-List";
- three videos "Better Safe than Sorry", "Survival at Sea", "Rambo Goes Deep-sea";
- 8 TV clips "Boat Safety Tips";
- audio-tape for radio programme on safety at sea.

It is very difficult to directly assess the effectiveness of some of the sea safety work in the Pacific islands. The methodology used to gain some insight during this survey is given in Section 10.2. In short, determining if the target audience is "aware of the awareness programme". Thoughts on what has been the most effective of the SPC materials for each country are given in the country sections of this report (e.g. Section 5.3).

¹⁶ In one country of the survey, neither the maritime surveillance adviser nor the Minister of Finance had an idea of the daily cost of a search/rescue operation using the national patrol boat.

¹⁷ It should be noted that SPC is involved valuable sea safety work other than its awareness programme (e.g. resource materials for courses).

In general, among the various people interviewed in the five countries, the SPC safety videos seem to be the most well-known in situations where people have access to video facilities. This includes urban areas and during visits of extension teams to rural areas. Fisheries officers tended to think the SPC posters are the most effective, possibly because they are often displayed in government fisheries offices. Some heads of fishing companies expressed the opinion that only limited distribution of the SPC posters occurs by government fisheries agencies.

Judging from comments of people interviewed, radio appears especially effective for sensitizing communities to sea safety issues. It was not often, however, that people interviewed for the present survey identified the radio programme material as being from SPC. This is likely to be due to lack of attribution by the broadcaster rather than greater effectiveness of programmes from other sources. As indicated in Section 11.2, radio appears to be especially appropriate for sensitizing remote villages to sea safety issues. There is also the possibility that language makes the radio broadcasts more effective in remote locations – the radio programmes are in the vernacular whereas most of the other SPC materials are in English or French.

Sea safety awareness work seems to have contributed to noticeable improvements in sea safety in several Pacific Island countries (Section 10.2), and it is likely that the SPC efforts were a major part of this progress. Previous initiatives on sea safety awareness in the region stressed that such work should be a continual process. McCoy (1991) states:

“In planning even modest programmes it must be realized that safety at sea is something which must be taught and continually reinforced. It is recognized that heightened awareness of safety in industrial societies is due to constant reinforcement. In the island countries, it is the almost total lack of exposure to safety awareness on a recurring basis that results in it being ignored. Programmes should thus emphasize the necessity for their continued, long term existence.”

The success of past SPC awareness work together with the on-going requirements suggests that SPC efforts in this subject should continue. Based on knowledge gained in the present study, the following should be considered for future awareness work:

- greater production of material in local languages;
- expanded use of radio;
- as awareness materials could be one of the few effective tools for improving sea safety in remote areas, more attention be given to those areas;
- use of more than one distribution channel to get materials to target audiences, including that of the Red Cross, disaster awareness teams, churches, and NGOs;
- consultation with stakeholders on the value of new initiatives (e.g. the safety management approach).

11.3 A regional sea safety workshop

The survey of the five countries and findings given in this report indicate there are several issues that, although crucially important to improving sea safety, have no easy solution. Included in this category are diverse topics such as:

- appropriate sea safety regulations for small fishing vessels;
- improvements in the SPC sea safety awareness programme;
- mechanisms for generation of political will to improve sea safety;
- improving the safety of fibreglass skiffs;
- enhancing systems of sea accident data recording;
- considerations on improving enforcement of sea safety regulations in both urban areas and in remote locations;
- achieving an appropriate balance between legislation and awareness for improving sea safety.

Many of the “tough issues” above have facets that involve law, naval architecture, search/rescue, community awareness, maritime administration, fisheries, and other fields. An examination of these

problems from the perspective of several different disciplines could result in progress that has so far been elusive. Consideration should be given to sponsoring a “think-tank” workshop of motivated individuals from different disciplines to address these and other critical issues dealing with sea safety.

It appears that focusing the workshop on small fishing vessels (less than 8 metres or, alternatively, undecked) would be desirable: these craft are the most common in fishing in the region, tend to be ignored by the shipping/maritime specialists, have many safety problems, and have been subject to much inappropriate regulation in the past. On the other hand, many of the problems of the larger fishing vessels are being addressed, or at least progress is being made.

Subject to further clarification/discussion, SPC indicates a willingness to cooperate in hosting a meeting of this type, including sending some of their staff to attend. In order to maximize the impact of the output of the workshop, it would be important that it be convened prior to a regional fisheries meeting or possibly a regional maritime meeting. In this way, the findings could be discussed for possible endorsement. Facilitating of national follow-up would be important.

11.4 Other issues

Not all aspects of sea safety in the region were covered in the survey. The detailed information collected in the five countries visited was largely restricted to five main topics: the relation of fisheries management to sea safety, safety programmes, data recording, legislation, and boatbuilding and vessel design. There were, however, some areas that were beyond the scope of the survey which appear to deserve additional attention. These include improving sea safety by:

- vessel communication systems;
- the use of village institutions;
- enhancing the availability equipment and spare engine parts.

12. Conclusions on future sea safety initiatives

The five major themes covered in this survey are the relation of fisheries management to sea safety, success of safety programmes, accident data recording, safety legislation, and boatbuilding and vessel design. Where the survey had useful findings or recommended action concerning the five themes, they are given in this report at the national level in the country sections and at the regional level in Section 10.2.

In considering future work in sea safety, it appears that certain topics covered in the scope of this survey deserve special priority due to their likely positive impact on sea safety or catalytic effect on safety programmes.

Sensitizing fishery managers that sea safety is a legitimate and important objective of fisheries management Progress in this area could have a very positive impact on sea safety in the region. As explained in Section 10.1 above, there appears to be no major objection to the concept among fisheries managers of the region, but rather they are unfamiliar with the concept and its potential benefits. Because it is the tuna fisheries that have the strongest relationship to sea safety in most Pacific Island countries, it is in the area of tuna fisheries management where most attention should be focused in order to encourage the management-safety link. As most of the national tuna management arrangements in Pacific islands are specified national tuna management plans, the modification of those plans to specifically address safety would represent an important step. Although there should obviously be efforts to sensitize national fisheries managers to the management-safety issue, the Forum Fisheries Agency (FFA) is also in a position to play a key role. The FFA is the regional organization charged with major responsibilities in providing tuna management advice to countries (including supporting the formulation of most national tuna management plans). Steps should therefore be taken to draw the Agency into the process of incorporating safety into management. The FFA is also important for the management-safety link in another respect; as the Agency provides legislative advice and actual drafting of national

fisheries legislation, sensitizing FFA's legal staff to safety issues is important so that fisheries laws encompass sea safety.

Focusing more attention on small fishing vessel safety The reality is that small fishing boats probably cause most of the sea safety problems in the Pacific Islands region but have received the least attention in terms of legislation, construction standards, enforcement strategies, regional discussions, training on proper use, and other schemes to improve safety. Not only do vessels under eight metres deserve more attention, it is needed in a different form than in the past. In the future, the various types of safety interventions should be oriented more to those types of vessels which are popular now and likely to be so in the future, rather than attempts to alter preferences.

Improving systems for recording/analysing sea accident data and making use of the results The effective analysis of accident data can have a remarkably positive effect on two important areas: (1) formulating and targeting of sea safety programmes, and (2) determining the cost of sea accidents in terms of lives lost and government expenditure for the crucially important generation of political will. The major tasks are demonstration of the benefits of data recording/analysing, establishing/refining systems (including the possibility of promoting a standard regional form), and using the results for educating responsible authorities.

Awareness programmes Education on sea safety through publicity campaigns was the major conclusion of the 1991 FAO regional safety study, the main theme of SPC's safety work, and is thought to be responsible for much of the progress made in sea safety during the past decade. In recognition that such safety awareness work should be an on-going process, the current awareness programmes should continue, but with some modification in emphasis. More effort should be made to get the awareness message to remote places where it may be the *only* practical mechanism for improving safety. Another important consideration is that the highly-appreciated SPC safety awareness tools should be viewed as a complement to national awareness efforts, not as a replacement.

Regional sea safety workshop A meeting which is attended by motivated people from several relevant disciplines, focused on challenging issues, oriented to small fishing vessels, and co-hosted by SPC could produce results having a positive effect on regional and national sea safety programmes. To be effective, follow-up work would be required to disseminate and facilitate implementation of the workshop output.

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Appendix: People contacted

Tuvalu:

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- Fatulolo Vave, Operations and Marketing Manager, National Fishing Corporation of Tuvalu
- Letasi Iulai, Senior Economic Advisor, Economic Research and Policy Division
- Tipelu Ilauani, Acting Superintendent of Police
- Ledr. Graeme Mustow, Maritime Surveillance Adviser, Tuvalu
- Ese Apinelu, Legal Officer, Attorney General's Office
- Bikinibeu Paeniu, Minister of Finance [former Prime Minister]
- Luke Paeniu, Aid Coordinator, Ministry of Finance
- Livi Tapu, Boatbuilder
- Taosa Vaisua, Fisher
- Soloseni Penitusi, Fisher, President Funafuti Fishermen's Association, father of boy lost at sea September 2001
- Laki Selapu, Fisher, veteran of two drift voyages

Tonga:

- Marc Wilson, Team Leader, Tonga/AusAID Fisheries Project
- Gerry Russo, Masterfisher, Tonga/AusAID Fisheries Project
- Manase Felemi, Secretary for Fisheries, Ministry of Fisheries
- Coco Haunga, Fisheries Officer, Ministry of Fisheries
- Lou Pale, Marine Officer (Nautical), Ministry of Marine and Ports
- Sione Tu'itupou Fotu, Secretary for Marine and Ports, Ministry of Marine and Ports
- Mark Korsten, Marine Surveillance Adviser, Tonga Navy
- Tony Fonokalafi, Commander, Tonga Navy
- Solomoni Savelio, Staff Officer, Tonga Defence Services
- Poutele Tuihalamaka, Emergency Services, Ministry of Police
- Bill Holden, fishing vessel operator, 'Alatini Fisheries
- Lenny Niits, fishing vessel operator, Maritime Projects Tonga
- Leo Nitts, fishing vessel operator, Maritime Projects Tonga
- Ronal Nair, agent for receivers, Friendly Island Fishing Company
- Aisea Tupou, boatbuilder [retired]
- Earl Emberson, Tonga International Gamefishing Association

Samoa:

- Tanielu Sua, Assistant Director, Fisheries Division, Ministry of Agriculture, Forests, Fisheries and Meteorology
- Peter Watt, Commercial Fisheries Adviser, Fisheries Division
- Savali Time, Senior Fisheries Officer, Fisheries Division
- Janine Narbutas, Maritime Surveillance Adviser, Samoa Police
- Peter Meredith, Samoa Marine
- Andrew Wright, International Waters Programme, SPREP/UNDP
- Maselino Tominiko, Assistant Secretary, Maritime Division, Ministry of Transport
- Rob Willis, fishing fleet operator, CJ Exports and Imports
- Ken Koniferisi, crew on alia vessel #217
- Solomona Poutu, Skipper, vessel *Malealani*
- Malaki Alatina and five other young alia crewmen
- Masanami Izumi, Fisheries Specialist, FAO/SAPA
- Lawrence Neru, National Coordination Centre, Samoa Police
- Foua Toloa, charter boat operator

Fiji:

- Malakai Tuiloa, Assistant Director of Fisheries, Fisheries Department
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- Suresh Chand, Principal Fisheries Officer
- John Ahtong, Fisheries Extension Officer
- Inoke Ratotodro, Principal Marine Officer (Regulation and Rule Making), Fiji Islands Marine Safety Administration
- Graham Southwick, fishing fleet operator, Fiji Fish Ltd.
- Robbie Stone, fishing fleet operator and former Chief Fisheries Officer, Ocean Trader Ltd.
- John Lucas, fishing fleet operator and member Marine Board, Solander Fisheries Ltd.
- Don Aldous, Fisheries Consultant, Forum Fisheries Agency
- Viliame Napoto, Maritime Commander, Fiji Navy
- Tui Levuka, Marine Surveillance Centre
- David, Manager, Manager, marine supplies store and fibreglass boatbuilding company
- Pauliasi, Lami-based offshore skiff fisher

Kiribati:

- Miteti Abete, Director of Marine, Ministry of Information, Communications and Transport
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- James Uan, Fisheries Training Officer, Fisheries Division
- Barerei Onorio, General Manager, Central Pacific Producers
- Katsuji Fujita, Fisheries Advisor, Overseas Fishery Cooperation Foundation
- Morris Franklin, EU Advisor, Tarawa Technical Institute
- Derek Pendle, Owner, Marine Products Kiribati
- Tiaon Matia, commercial troll fisher, Betio
- Teken Tokataake, owner, Bluefin Fishing Company
- Kaobunang Kaitano, commercial troll fisher, veteran of six-week drift voyage
- Remi Temake, captain of commercial fishing vessel

Other:

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