

# Fishing Vessel Safety Conference, 1983

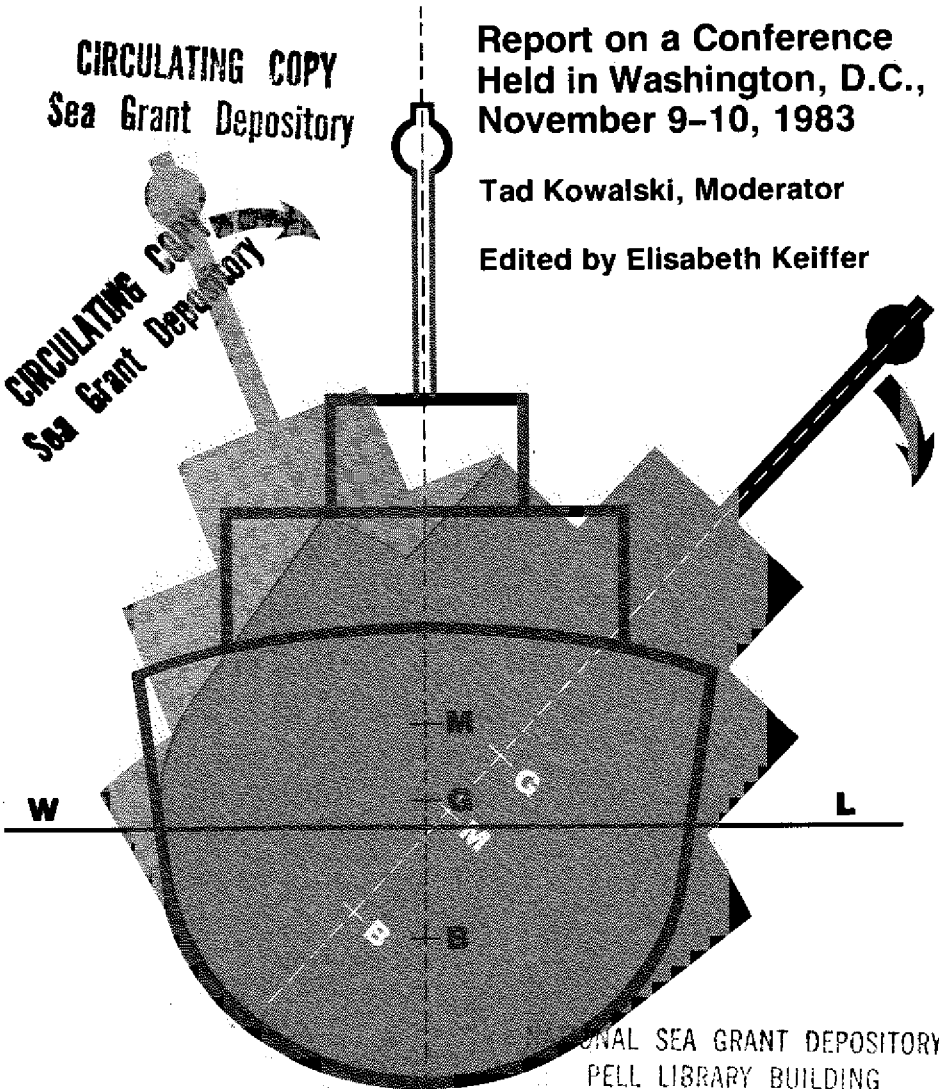
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Report on a Conference  
Held in Washington, D.C.,  
November 9-10, 1983

Tad Kowalski, Moderator

Edited by Elisabeth Keiffer



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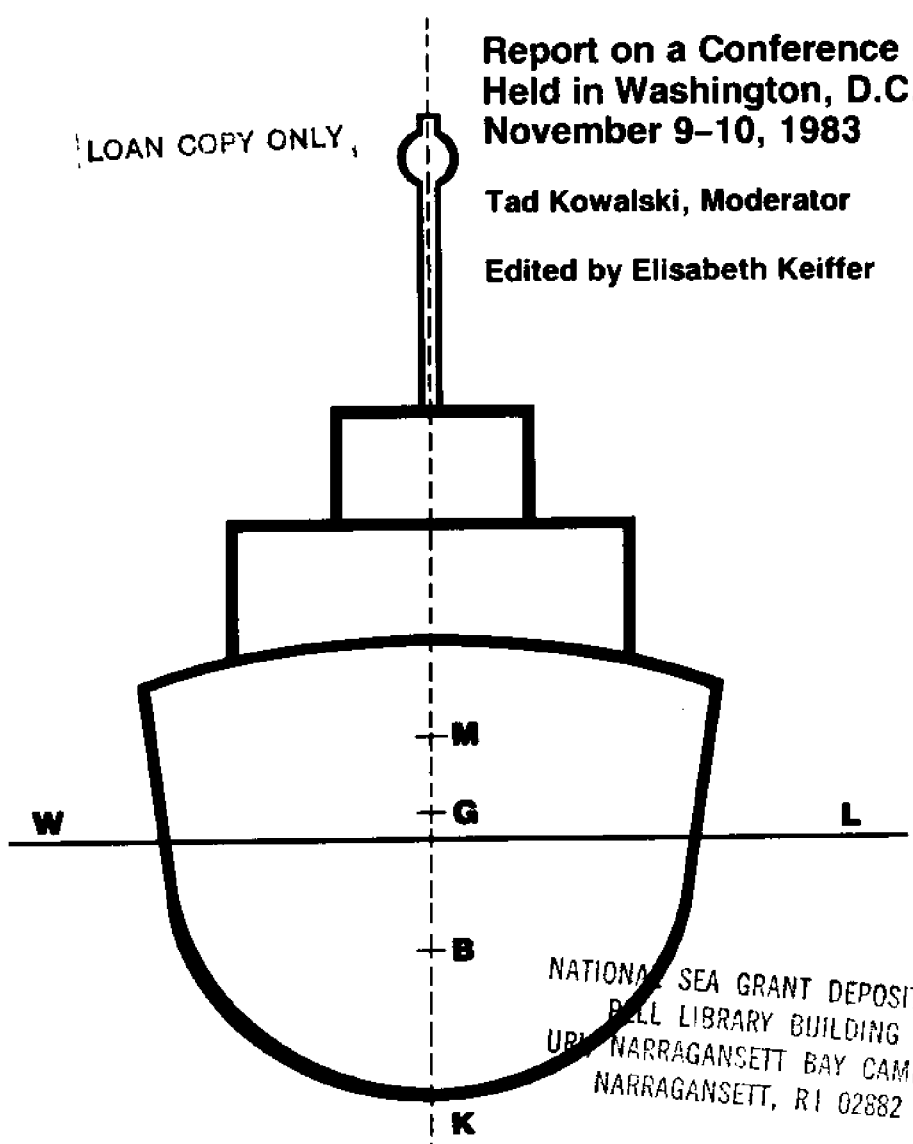
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OPENING REMARKS

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Tad Kowalski, Moderator

I would like to welcome you to this meeting of people and organizations interested in the topic of fishing vessel safety. The idea of such a meeting came up during discussions among the two established fishing vessel safety bureaus at the University of Washington and the University of Rhode Island as well as the Florida Institute of Technology and the Sea Grant Office in Washington. It appeared that it would be a good idea for us to get together and discuss the many aspects of fishing vessel safety. We were discovering more and more people who are interested in the subject.

What we hope to learn from this meeting is who is working on vessel safety, where and how far they have gone, and to establish some linkage and cooperation between all the activities. In our final session tomorrow we would like to discuss whether there is enough of a consensus to plan future meetings and how to keep in touch with one another.

Now I would like to turn the meeting over to Mr. Robert Shephard, Chief of the Marine Advisory Services, NOAA.

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## INTRODUCTION

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Robert J. Shephard  
Chief of Marine Advisory Services  
National Sea Grant College Program

We are delighted to be sponsoring this conference here in Washington. When Tad talked to me about the possibility several months ago, I realized there was a lot of interest--as you people here today prove--in fishing vessel safety, and a lot of confusion about what should be done. We thought it would be a good idea to let each other know what we are doing and to get some guidelines as to what more needs to be addressed, including any legal aspects that may come up.

We think the informality of this meeting may be its strong point. This is not a conference; it is a discussion group. People will make presentations, but we encourage all of you to jump in, discuss and ask questions. This is a grassroots campaign and a starting point for considering vessel safety from the United States viewpoint.

Tad tells me that an international organization has been involved for many years in fishing vessel safety. We are far behind them. But, perhaps, out of this small beginning here we may become a group interested in tying in with them. Fishing vessel safety is paramount in the lives of many of our people who are involved in the fishing business. So, a warm welcome to all of you, and now I would like to introduce Ned Ostenso, Director of Sea Grant.

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WELCOME

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Ned Ostenso  
Director, National Sea Grant College Program

Since I have been in the Sea Grant Program, we have been giving a little, albeit far too little, attention to vessel safety. On a global scale, it may not sound like a big problem, but when you're talking about lives lost and the impact on small communities and small economies, it is serious. One life needlessly lost is one too many.

In NOAA, we have been putting a lot of effort into the environmental aspects of marine safety. For instance, we are trying to better understand conditions at the mouth of the Columbia River, where we lose several ships a year. We have also developed a program to improve the quality of weather forecasts for vessels at sea; our marine-reporting program, MAREP, is one example. We have set up a cooperative program with fishermen who radio on-the-spot weather observations back to their local co-op or port. The data is forwarded to the Weather Service and immediately comes back as part of the forecast. This is a program we have been developing on a regional basis and hope to make national.

But there are a lot of other dimensions to vessel safety; training and education, economic incentives, legal problems, to name but a few. The whole sociology of vessel safety is a fruitful field for research. For instance, in the case of aircraft, not only accidents get reported, but all near accidents or potential accidents must also be reported. As a result, in air transportation there is a rich body of data to work with. Unfortunately, in the maritime industry we do not have that kind of reporting, so there is little information to work with in addressing the problems of marine safety.

There are two things I hope may come out of this meeting. One is the sharing of what we know. But perhaps even more important is an understanding of what needs to be done and who is best able to do it. Clearly, Sea Grant is not going to go into the vessel inspection business. And probably we are better off supporting some of the "soft" sciences like training, education, economic incentives, insurance incentives, and so forth that might lead to greater vessel safety. We need a clearer understanding of who is best able to play what role in fitting together all the pieces of the puzzle. Thank you.

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PRESENTATION: URI FISHING VESSEL SAFETY BUREAU

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Tad Kowalski  
Professor, Department of Ocean Engineering

I would like to start this meeting by telling you about the University of Rhode Island's Fishing Vessel Safety Bureau. We have other activities connected with fisheries here at URI, of course. We have an academic degree program in commercial fisheries and marine technology, the Marine Advisory Service under Sea Grant, and the Coastal Resources Center, which is the research arm of the state's Coastal Management Council. So the Fishing Vessel Safety Bureau fits well with the university's overall pattern of assistance to fishermen.

About three years ago, we undertook a feasibility study to see how we should proceed to improve the safety of fishing vessels. The study showed that there is a tremendous need for such an activity, and so we started working on the ground rules, techniques for obtaining stability criteria, and the operating philosophy of such a bureau.

In the study, we identified four main areas of safety needs. The first is vessel stability, then vessel seakindliness--that is, the motion of a vessel in real seas--then fuel efficiency, and, finally, education in vessel safety.

In New England, vessel stability is one of the biggest problems. There is such a variety of vessel types that we found we have to determine stability on an individual basis. Even when the hull is the same, the final version of a given vessel, the equipment, etc., make it quite different from any other.

One of the first things we learned is that establishing criteria for the safety of vessels is very difficult, mainly because of two things: first, on this coast, fishing vessels do not have any drawings or other basis for calculation or investigation. We have not found one vessel yet that had complete drawings of, say, the underwater hull or of the equipment on board. Secondly, fishermen constantly alter their vessels. They keep adding equipment and this produces problems with the weight distribution and the center of gravity.

So our first task was to produce drawings of a given vessel. To do that we had to develop a method of lifting the underwater lines while the vessel was in drydock and then calculating the hydrostatic curves and stability criteria.

We have now developed a method of obtaining the shape of the underwater hull by means of a surveyor's theodolite with the addition of an EDM (Electronic Distance Meter). This is an infrared source that bounces the light off the object and thus gives the distance between the instrument and the hull. With this, one can re-create the offsets of the underwater part of the hull. From the U.S. Navy we obtained a computer program that gives us the hydrostatic curves and the stability characteristics of the vessel. So we now have developed a system for determining the stability characteristics of a vessel, once we get it out of the water.

We are also using an inclining experiment that determines the center of gravity of the boat. We have looked, too, at shortcuts for establishing stability. One of the main ones is the roll period



experiment developed by the IMO (International Maritime Organization). With it, you can roll a vessel to measure its natural period of roll and use a formula that gives you the metacentric height, which is the basis of the stability criterion. The only problem with that formula is that there is a constant in it which was developed for larger vessels than those operating in New England waters. It is mainly for vessels of a hundred or more feet in length, whereas most of our vessels are between 40 and 80 feet. So we were not too sure we could apply the coefficient that the IMO is using.

But by doing the hydrostatic investigation on the hull, the inclining experiment, and the roll period experiment, we were able to recalculate a constant for some types of vessels. We are still trying to accumulate a statistically sufficient number of those experiments to say that the constant is applicable to most of the vessels in this range of lengths. From the four or five vessels we have worked with, we are finding that the IMO formula is quite a good one. This is helpful to a fisherman because it means he can measure the period of roll of his vessel at sea with reasonable accuracy, and, given the formula with the appropriate constant, he can estimate the vessel's stability at that time. So that is where we are heading at the moment--to give a skipper an on-the-spot way of checking whether he is overloaded or whether, under certain sea conditions, he is approaching danger.

Along with estimation of stability, education of skippers and crews has turned out to be very important. Many fishermen are not at all knowledgeable concerning problems of safety from the stability point of view. So we are also going in the direction of one-day seminars or other meetings where we make short presentations on what is important in stability matters. We also use these opportunities to tell fishermen they can come to us for help.

Since we are working under Sea Grant funding, we also try to get commercial organizations to do as much of the work of establishing stability criteria as possible. Our role is basically an advisory one.

The Department of Ocean Engineering, with which I am affiliated, will still provide technical assistance with Sea Grant support and will keep developing new ideas and areas of research. We are looking at two at present. One is involved with vessels purchased in the south, where they are cheaper, that were designed as Gulf shrimpers and then brought up to New England waters and converted for dragging. From the stability point of view, this is a bad idea because it means piling on a lot of top weight, which reduces the basic stability. These converted vessels are now also operating in more severe sea conditions than they were designed for. We are trying to learn what happens in these conversions and how to make them as safe as possible.

The second area of research is seakindliness--the behavior of vessels in waves. Our aim here is to determine the behavior of a specific hull in specific sea conditions in order to give the skipper an indication of whether it is a waste of time and fuel or even unsafe to take his boat out.

After we have determined the stability of a vessel, we complete a report for the owner or anyone else interested. The problem we find in issuing a report like this, of course, is liability. We have a disclaimer, drafted by the university's law firm, but I don't know how

binding it is. Vessel stability can be a very nebulous thing. Static stability, which is what we measure, and stability in real seas can be two very different matters. Seamanship, or the way the vessel is handled, also has an important bearing on the safety of the vessel.

As an example of our work, let me present the following two case histories.

Vessel A is an 87-foot stern trawler of Gulf Coast design. She has a stern ramp, net reel aft, and is hard-chined with twin diesel propulsion. Three fish holds run aft from amidships, with the engine room forward. Although no two fishing boats are alike, this vessel is representative of a broad type of local fishing boat. The boat provided an understanding of the general stability problems involved for this design type. The actual process of this study became an education in another type of problem, that of scientifically analyzing a poorly documented vessel.

Since a lines plan was incomplete, the first order of business was to redraw the lines plan, filling in the missing transom and the large center-line skeg. Direct, on-board measurements were made where possible. Several times dimensions had to be determined from interviews with those involved with her construction. The next step involved taking the offsets from the plan and entering them into the Ship Hull Computer Program (SHCP). This program produces hydrostatic curves and tables of righting arms. The program was originally developed for U.S. naval ships. Considerable manipulation of the input data was required before it could digest the awkward corners of the fishing vessel shapes. After each computer run, the graphic output was studied to determine whether the computer interpreted the correct lines of the hull. It took several runs with additional sets of offsets before the hull was properly defined.

A standard inclining experiment was then arranged. All slack tanks were measured. A roll period test was also performed in order to compare the GM calculated from the inclining experiment with that predicted by the IMO roll period formula. The free surface effects of the slack tanks were found to be negligible. The two GMs were found to agree very closely. A table of righting arms was then obtained from the computer program. The righting arms were compared with the IMO criteria and gave the "as inclined" condition of the vessel.

Three more conditions were calculated: ready for sea; returning to port with fish holds half full; and returning with holds full. It was found that not all the available hold spaces could be safely filled. A series of loading arrangements were analyzed to determine the maximum quantity of fish which could be carried without compromising the stability criteria. With some arrangements, the trim was deemed unacceptable and these loading conditions were discarded. From the analysis a report was generated and provided to the boat owner. Typical curves of righting arms are shown in Figure 1.

In our second case history, Vessel B, after a tragic capsizing of a 40-foot clam dredger, including loss of life, the U.S. Coast Guard requested that we estimate the compliance of the sunken vessel with the safety recommendations based on the IMO criteria.

The vessel's hull was salvaged but was not intact, so an inclining experiment could not be performed. A sister hull did exist but she was outfitted for lobstering. Each vessel had been purchased as an open fiberglass hull from a local manufacturer and completed by the owner. The manufacturer provided an apparently complete lines

CONDITION	DESCRIPTION	DISPL. LT.	VCG. FT.	GM. FT.
1	READY FOR SEA	239.6	13.7	1.8
2	LIFTING 3,000 LBS	295.4	13.1	2.4
3	RETURNING W/108LT	324.1	13.1	2.5
4	RETURNING W/79LT	294.1	13.0	2.5

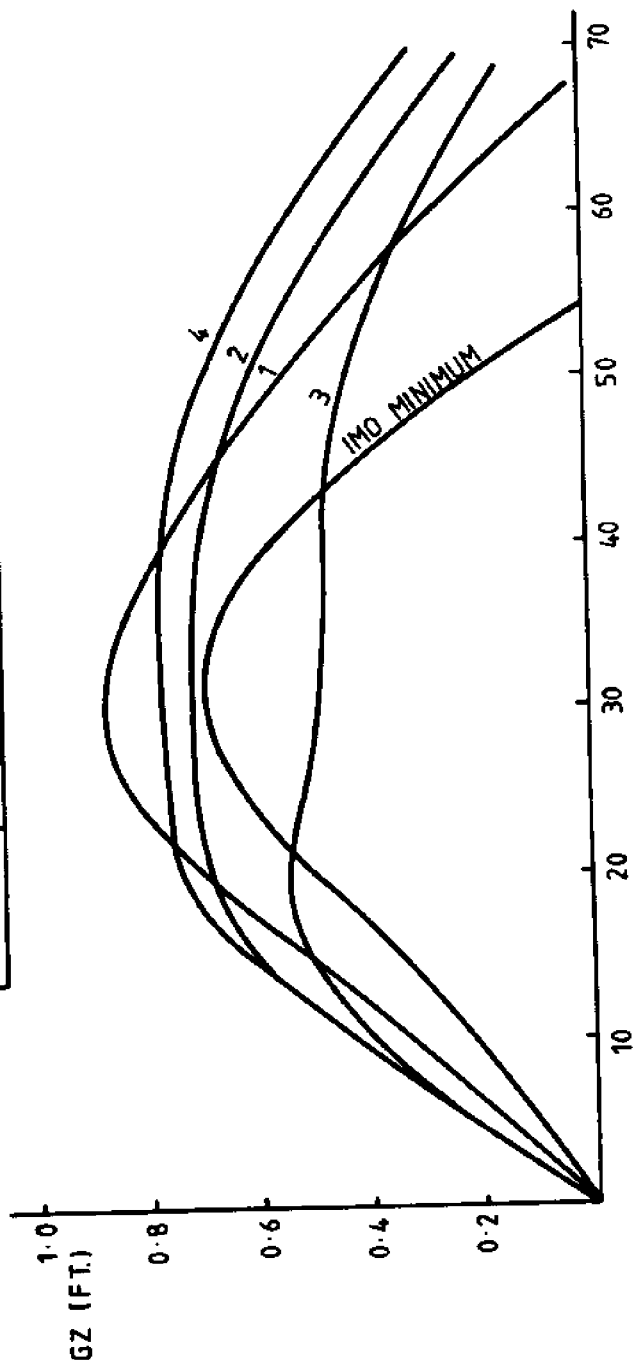


Fig. 1.- ANGLE OF HEEL, DEGREES

plan. But on close inspection it was discovered that the three views shown were inconsistent. So again, an accurate plan had to be drawn. From this plan an arrangement sketch of the sunken vessel was made.

A newspaper article was also discovered announcing the christening of the vessel the year before. It listed many of the outfitting materials. Examination of the hull helped verify many of the construction features, but one critical part, the A-frame, was still underwater. A salvage operation was launched to recover, weigh, and calculate the center of gravity of the A-frame. The GM was calculated from an inclining experiment on the sister vessel. It was also compared with the GM obtained from the roll period experiment. In this case, however, the GMs were not in good agreement. It is believed that the IMO formula does not apply to semi-planing hulls in the 40-foot range.

The displacement, LCG, and KG of the lost vessel were now estimated by adding and subtracting weights and moments. Values of static stability criteria were established for the sunken vessel; they are presented in Table 1. The righting arm and areas under them were far below the minimum required by the IMO recommendations.

The results obtained formed the basis for the conclusion that the vessel sank in moderate weather as a result of inadequate initial stability.

## DISCUSSION

Tyrrell: Do any of your curves take shifting cargo into account?

Kowalski: No. They do take into consideration the free surface of fuel tanks and any fresh water carried on board, but not the fish cargo, especially on the quarterdeck. We point out to fishermen the necessity of restraining boards so that cargo shifting is restricted to a much smaller area.

Tyrrell: How well do fishermen respond to your suggestions?

Kowalski: We find that those who have well-designed, safe boats come to us regularly. But fishermen with marginal boats are hesitant, probably because of insurance.

Harrison: What would it cost a vessel owner who has no records on his boat to have a set of stability curves prepared?

Kowalski: We have been doing it free as part of our research, but it is not a service we could provide on a regular basis, so I really cannot say what we would need to charge. A commercial outfit would charge between \$2,000 and \$4,000, including hull measurement.

Harrison: I see a problem right there. Unless there is a requirement from a higher authority for proof of stability, you are not going to see any vessel owners spend the money for it, even for their own safety.

Kowalski: Of course, there is not only the cost of the stability analysis but the cost of making the vessel safe if it is found not to be. But, as I see it, the problem might be solved by having the government, the industry itself, or possibly the insurers require proof of stability.

Harrison: It won't work. If an insurance company tried to get hard-nosed about safety, the vessel owner would just go elsewhere. There must be several hundred so-called insurers on Grand Cayman

Table 1

Criteria	IMO Recommendations	Vessel B			Heavily Loaded
		I	II	III	Sister Vessel
Area under GZ Curve up to 30° Heel	10.3 ft-deg	5.68	7.07	6.24	16.33
Area under GZ Curve up to 40°	16.9 ft-deg	5.89	7.73	6.91	21.04
Area between 30°-40°	5.6 ft-deg	.21	.74	.67	4.72
Min. GZ at 30°	.66 ft	.1	.18	.17	.63
Max. GZ Located at	20°	12°	14°	14°	20°
GM Min. (Resolution A. 207 (VII))	1.87 ft	1.80	1.86	2.05	3.06

Operating conditions:

- I Vessel at the time of capsizing.
- II Vessel without cargo (ready sea).
- III Vessel with suggested 4,000 lbs. of ballast in her bilges.

Island, for instance. The owner is all right until he has a total loss and finds out the company can't pay him. He believed he was insured when he wasn't.

Adee: We have a fleet in the Pacific Northwest where a stability test and a stability letter are prerequisites to getting insurance. That's the king crab fleet. I think its record for loss of life and loss of vessels due to instability is about the worst in the country. Even if a stability letter is required, we find its use is minimal.

Kowalski: So what is the solution?

Adee: I don't think the insurance companies themselves can solve the problem, but maybe they can have someone do it for them. On our coast a number of insurance companies have stopped writing policies on the crab fleet and have simply written to their insured vessels that they have 15 days to get new insurance. One of those companies had a large percentage of the business.

Kowalski: But is there another way insurance is being handled? I understand that in fishermen's cooperatives the members police each other because otherwise the coverage for everybody goes up.

Harrison: New Bedford has a big fishermen's cooperative and they are having a terrible time with their hull insurance. They're changing underwriters every year or so. The industry does not police itself. I see it on boats every day.

Goudey: I think the one area where we can make an impact is in public education. Tad has said his group doesn't have the resources to do a complete study of all vessels, nor, in fact, should it. That certainly would be competition with private consultants and naval architects. But I don't know any fisherman who doesn't value his life more than two or three thousand dollars. If he can be convinced that he may be at risk, he would be more likely to pay the costs of a proper stability analysis. Another point I would make is that inadequate GM is only one measure of vessel stability. I think there needs to be some work done in understanding other mechanisms so that we can evaluate designs and see which ones are more suitable for these waters and which ones more prone to capsize.

Lassen: I agree that educating both skippers and insurance companies is vital. If insurers understand the value of stability information, perhaps they would offer better rates or use some other means to encourage fishermen to make use of the programs and research that are available. Has the URI work been published?

Kowalski: It will be published as a Sea Grant report. Now I would like to ask Mr. Perrini whether the Coast Guard has a permanent or temporary representative to the IMO in London?

Perrini: Originally, the fishing vessel panel was part of the safety/stability subcommittee in IMO. But after the Torremolinos Convention in 1970 that panel became part of the parent subcommittee again. Stability is considered minor business now. We do have a delegation that goes over every year to discuss stability, subdivision, and load lines in general, but mainly with respect to the merchant marine.

Klotz: We also have an individual who attends meetings of the stability subcommittee who is knowledgeable about fishing boats. But, as Frank Perrini says, it's not one of our primary concerns. I would like to ask what you think is the future of

these commercially available on-board instruments that read the vessel's roll and sound a warning, if necessary. Are those so expensive fishermen can't afford them?

Kowalski: They cost about \$3,000 from the Ocean Motions Company in Barrington, Rhode Island, and are sold primarily for merchant ships. For fishermen they really are too expensive. At one point I proposed producing a simple one at the university, because all you need really is a pendulum, something very simple, very cheap. But we didn't get funded. All you need really is to measure the change in the roll period for an indication of whether you are approaching a danger zone. You may get into it very quickly, of course. This is not an instrument that will prevent flooding, for example. Flooding has already happened by the time the alarm sounds. And it is not at all a hundred-percent answer to the safety problem.

Adee: The device I am familiar with is the new one introduced by Wesmar. It costs \$4,800 without options. I have some questions about this kind of device. One is, since the primary cause of stability failures is not necessarily a lowering of the GM, I wonder about the utility of using period of roll and then recalculating GM and using that as the stability index. Secondly, in the larger vessels I am familiar with, at the time of the inclining the vessel is as light as possible. So how good is a roll period measurement under those conditions compared to when the vessel is operating at sea?

Kowalski: The vessel underway will have a different roll period. Speed affects the roll period. I was thinking more in terms of when they are hauling the nets or loading the holds and are more or less stationary.

Goudey: Not to beat this instrumentation business to death, but one of the assumptions it is based on is that roll constant  $K$  is a constant, which, in fact, it is not. It varies with loading, and that can throw off this calculation to some degree. Another difference between using these instruments on merchant ships and fishing vessels is their obvious difference in size. For a fishing vessel, low period waves based on long swells coming by could cause unnecessary warnings and make it a nuisance for fishermen.

Kowalski: You have to know how to interpret it. That is where education comes in.

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PRESENTATION: MIT FISHING VESSEL PROGRAM

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Clifford A. Goudey  
Fisheries Engineer  
MIT Marine Advisory Service

I represent the MIT Sea Grant Program. The work we have been doing in fishing vessel safety dates back to my student days in 1975. One of our first projects was the development of a towing block for side trawlers.

For those not familiar with a side trawler, the two towing cables have to be fairleaded to the quarter in order to tow in a straight line. The cables have to be pulled in by a grappling hook and then have a pelican hook wrapped around them. The entire process offers possibilities for serious hand, head, or bodily injury. Usually the vessel will go into a hard turn to the side where the gear is being run. In the process of releasing it, the crewmen often have to use a pry bar because there is so much tension in the towing block. Very often the block can be deflected upward, causing injury.

Research in the Mechanical Engineering Department at MIT developed a device which can be clipped on very easily, and released by pulling a lanyard with very little recoil. It simply drops down to the side of the vessel rather harmlessly. A commercial version is being used on a number of side trawlers in New England. A modified version of this design is being used by the Coast Guard cutter Alert in their new inflatable lifeboat system and shows the versatility of the concept. The feature of being able to release under load has lots of applications in the marine field and this is just one of them.

Another problem identified for us by the fishing industry was the danger of securing the trawl doors during the hauling back of fishing trawls. On many of the side trawlers, you have to reach through numerous struts and wires to do it, and in a heavy sea arms and upper body are in peril. What we did was develop a mechanism which can automate the whole process by securing the cable just ahead of the door as it comes up beyond a hanger. It does require some rigging changes, but it eliminates entirely the necessity of being near the door unless it is totally secured.

Another project studied the feasibility of sail-assist on fishing vessels. We did preliminary designs of a sail installation on the side trawler Vincle-N. An important area of concern was the implication for stability. We estimated, based on towing experiments, that the vessel could achieve six knots in a wind of 15 to 20 knots, with the small sail plan considered. I am not too comfortable with predictions of fuel savings, since they don't often hold true, but a 20 percent reduction in fuel consumption seems reasonable. We did similar studies, but in somewhat less detail, on a St. Augustine-type trawler. In this case, we used a very small rig comprised of two roller furling jibs. When the vessel is tacking, you roll up one side and deploy the other. It's a rig made necessary by all the handling gear aft of the mast.

This project was an area where we were very concerned about stability, since we hope to proceed to a demonstration phase. One of



the advantages of sail is that it reduces the roll of a vessel, though it can impose some constant angle of heel.

In another effort relating to stability, gill-netters out of Chatham, Massachusetts, called on us to answer some questions on stability. They were considering adopting on-deck insulated containers and were concerned about the implications for safety, since this would place the weight of the fish higher than it is at present. We considered using techniques such as measuring the roll period and estimating stability conditions.

Chatham is notorious for vessels capsizing when they cross the bar to enter the harbor. It is obviously not a case where one can simply judge the stability based on static GM. Dynamic effects have to be taken into account. We were therefore unable to provide the simple guidelines they desired.

On another occasion, we were asked by the Coast Guard about the losses of the new 41-footers. We found that the well deck aft, which is where most of the work is done, is a rather large open area with high bulwarks and small scuppers. Some calculations of the sloshing period of water at various levels showed that it coincided, in many cases, with the natural roll period of the vessel. We felt that this might be a contributing factor in some of the losses. We recommended that the scuppers simply be enlarged or the open area divided with two longitudinal removable bulkheads, which could cut free surface effects by an order of magnitude.

While the prime mechanism for capsizing is through an inadequate GM, there are three others. When the vessel is in a following sea and its speed and the speed of the significant waves are the same, the vessel can become perched on a wave and reduce its water-plane area. Momentarily or for a good period of time, it can have serious loss in GM. This is not something that can be calculated at the dock, nor something that automatic alarms pick up. But if this synchronism with the wave exists, the boat can roll over.

Another situation exists in following seas while the vessel is being overtaken by waves. A phenomenon can happen that is called "broaching." It is a combination of forces on the rudder and on the forefoot caused by wave-induced velocities that results in a yawing moment. A vessel can then find itself in a beam sea that it wouldn't ordinarily get into. All of a sudden a breaking wave can capsize the vessel. Such conditions are common in the Oregon inlets and in the Merrimac River.

The final mechanism for capsize is synchronous rolling. If the roll period coincides with the frequency of encounter of the waves from any direction, synchronous rolling can result, and if the roll proceeds beyond the range of positive stability, the vessel will capsize. All of these three mechanisms are not adequately covered in a static analysis of stability.

There is work being done at MIT in these areas as they apply to naval and merchant ships, and I think that much of the information can be applied to fishing vessels. Fishing boats often operate in sea conditions where their lengths are smaller than the wave lengths they are encountering. These dynamic causes of capsize are therefore even more important than on larger ships.

A related project which may be of interest was done by Steve Judson, then a graduate student in the Department of Ocean Engineering. He studied the resistance and motions of fishing vessel

hulls in head seas. I will let Steve Judson describe his work. Two facilities we have at MIT were used: one is the towing tank, which has a wave generator that can produce any sea conditions you like, and the other is a ship motions computer program, which can, in some cases, quite accurately predict the motions of vessels in a given sea state.

LT. STEPHEN R. JUDSON: The work I did was not so much safety-related as it was performance-related. The initial idea was to try to gain some information for Coast Guard rescue boat stations. If they received a call from a fishing vessel in distress, they would be able to choose the right size of rescue vessel to take out to assist the fishing boat that was in trouble. The study involved obtaining resistance information for vessels in a seaway. Models were built and tested in the towing tank at MIT, and I also ran the same models through the ship motions program.

Three models were tested representing typical New England fishing boats with lengths of 76 feet, 119 feet, and 139 feet. They were tested for added resistance in various seaways. The resistance in waves was, in some cases, three times the calm water resistance. The results of these tests will be presented at the fishing vessel conference in Florida in May of 1984.

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PRESENTATION: UNIVERSITY OF WASHINGTON FISHING VESSEL SAFETY CENTER

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Bruce H. Adee  
Director, Ocean Engineering Program

I thought I would give you a historical view of what we have been doing. Our official Fishing Vessel Safety Center started on January 1, 1978. For a couple of years before that, we had worked on several projects related to stability in the Alaska king crab boat fleet. At that time, the total loss within the fleet was over five percent a year. Insurance companies, of course, were writing policies at one and a half or two percent of the value of the hull.

We decided at the outset that we needed some sort of data base on capsizings. We were interested in information about the boat, year built, material, size, location, weather factors, general condition, and dollar amount of loss, as well as damage to cargo, crew, and everything else. We were primarily interested in hull losses. When we tried to get this information from insurance companies, we found they were unwilling to give out P & I data. So we limited ourselves primarily to hull data. With the help of marine underwriters and brokers we put together a form that was easy for them to use. We found we got good cooperation, though we were surprised that they didn't have more information. They did not have much on wind or weather. The main thing they had was hull data, the loss that occurred, and where it occurred. We also got good cooperation from the Coast Guard. They sent us all the information on the Pacific Northwest casualties that went through the Washington office after they were signed off.

About that time, our Sea Grant funding was cut, and we had to give up this project because it required a lot of time and effort and we didn't have the money to do it. We're glad to hear that the Marine Index Bureau has taken up the challenge and that the National Council of Fishing Vessel Safety and Insurance is also working on it.

So, we identified a lot of areas where we thought work was needed. One was education and training. At that time, in the late seventies, there was a very serious problem in our fishery with fires involving polyurethane, exposed polyurethane foam. This material was used throughout a lot of fishing vessels, and there was a total disregard for safety when performing welding or other operations. In one case, a \$4 million fire started because the safety watch was off having a cup of coffee while welding was being done.

We held a number of seminars on this subject. Probably the most effective thing we did was hold one for brokers and underwriters. Since then we've had a lot better luck with this polyurethane problem.

We have a stability show that we take on the road as far as Alaska. We have had good cooperation from the marine surveyors in our area. Our local hospital has held several medical seminars on emergencies at sea, which were very effective, and we found that a good way to get stability presented was to include it in these seminars. The Sea Grant marine advisory programs in Oregon, Washington, and

Alaska have all been extremely cooperative and have invited us to do our stability road show in many different cities.

In talking to surveyors, we found that one of the basic problems was the different levels of communication. You have fishermen on one level, marine surveyors on another. Then there are brokers and underwriters and, on another level, naval architects. In general, communication among these groups, at least from an outside perspective, is minimal.

We worked with marine surveyors particularly and developed a safety checklist. One of the complaints we got from brokers and underwriters was that every marine surveyor's report is different. There is no basic set of guidelines used.

Our idea was to provide a checklist not only for surveyors but for skippers, so they could walk around their boats and go down the checklist themselves. It was a way to make them more aware of various safety needs aboard.

We also worked closely with the National Council on Fishing Vessel Safety and Insurance for a number of years, publishing a newsletter that we have had since long before they began their Washington office. I am glad to see they are continuing and enlarging their activities.

When I thought about areas of activity that a typical safety center might be involved in, I separated them into three that seem important. One is information-gathering. Judging by our experience, it's just too costly to try to create your own data base. Use what is available--the Coast Guard data base, National Council data--as it becomes available. Just filing newspaper accounts of sinkings and keeping up with what is going on in the fleet is useful. Make a library.

Incidentally, I'd like to recommend that all of us here today arrange to share and circulate whatever reports or publications come out of our offices.

As I mentioned, contacts are important in information-gathering. It's hard to maintain them with fishermen because of the numbers involved. It is probably easier to work with the managers or associations.

The second important area is education and training, and one way to initiate it is by just being there, having a phone and a name that people can call when they have questions. It's very important, I think, in cooperative work to establish continuity. The safety center should serve as a reference point that fishermen recognize. Seminars, I believe, can also be useful. I think the traveling show has been successful in some ways, unsuccessful in others. Finally, the last area I think that is important for centers to work in is research. I include both basic research, which may not have an immediate application, and applied research, responding to a particular need. I should add that in trying to develop alternative sources of funding besides Sea Grant for this type of research we have found that most everybody in the traditional funding areas seems to shy away from it. "We don't regulate the fishing boats, so why should we spend money on them?" seems to be a typical response. The major contributions to research have come from the British, the Scandinavians, and the Russians. As a result, we get the stability criteria we have now. We are not really sure how the IMO standards relate to the types of vessels we have here--they're quite different from all North Sea vessels. I think

this is an area we should do a lot of thinking about.

Finally, I have a few questions I would like to bring up as possible discussion topics for tomorrow. One is how do we measure our cost-effectiveness? How do we compute the number of vessels that aren't lost because of our work? Second, at what point are we interfering with commercial operations? Third, how should we deal with the problem of liability? This question could apply to much of our advisory work, not just vessel stability. Last, I hope we might discuss commercialization of ideas.

## DISCUSSION

Tyrrell: Has any work been done on redesigning crab traps?

Adee: Quite a bit, but not any brought to practical fruition.

Generally, redesigning tends to make the devices too complicated and cumbersome and breakable.

Tyrrell: Is there an alternative to traps?

Adee: I understand they used to catch a lot of crabs in trawls. But, of course, you've got to keep the crab alive, so if you damage the shell and you're going to be out a few days after you've put them aboard, they generally die. And processors will not take dead crabs.

Sainsbury: There is a method of tangle nets that is used on a similar type of crab down in the southern part of South America in the Straits of Magellan. Those are worked in the sheltered places in the Straits. I don't know whether the method is applicable in the conditions under which you work.

Adee: Normal operating conditions are probably waves seven to ten feet high--in nice weather. Remember, this is a fishery that starts in August or September and goes on as long as the season is open, up in the Bering Sea and southeast of Kodiak Island. So the vessels operate in very severe weather.

Klotz: You mentioned fishing seasons and I read a statement--in National Fisherman, I believe--that the commissioner in charge of coastal affairs in Alaska said he was going to extend the season until February, on the theory that that is the worst time of year and not many boats will go out then, so it will help conservation. That scares the daylights out of me.

Adee: It's totally irrational! When a fisherman has a couple of million dollars invested in a boat, he has a tremendous cash flow problem. If he doesn't fish, he is going to lose his boat. So, any fisherman is going to go out any time there is an opening. The recent closing of the Kodiak fishery only puts more pressure on the other ones.

Klotz: Who makes these decisions? Are they political?

Adee: The Management Councils, I guess. I assume that's the Alaska Department of Fish and Game. Depends too on whether it's offshore or inshore, whether it's state-regulated or federal. But these are critical decisions, and one of the problems we face is that the people who regulate the seasons--not the catch--are generally trained in the social sciences and have no technical background. They come up with regulations that are enforceable but not necessarily concerned with safety.

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PRESENTATION: FUTURE OPERATION OF URI SAFETY BUREAU

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Duncan Amos  
Commercial Fisheries Specialist  
URI Marine Advisory Service

You heard this morning how the Fishing Vessel Safety Bureau at URI started out. Presently, we are mainly concerned with the adaptation of vessels to our fishery. There are an awful lot of vessels here that come out of the Gulf of Mexico, ex-shrimpers, that are brought up to the East Coast and converted. The conversion usually means the addition of top weight. I should add that most of the time a naval architect is not even consulted. The fishermen have local welding companies and engineering companies that will make up the net reels, the A-frames and gantries, and they buy the blocks from chandlers and hang it all together themselves with the assistance of welders and engineers. A naval architect may never be consulted on what this is doing to the vessel.

So our next year's work will be to take one of these Gulf shrimpers when it arrives at Point Judith, our local port, do the calculations on her in her bare state--as she was as a shrimper--and then work with the fisherman who is converting her. Because of our involvement, we would probably have to tell him at some stage that if he gets into a bad area he's going to have to change it somehow.

Ultimately, we hope to produce some form of publication as a result of this work which would contain not recommendations but guidelines. We can't very well tell anyone specifically what to do, because, as was already mentioned this morning, that would have legal implications. We will come out only with so-called guidelines and stress the fact that every vessel is different and every fisherman will have his own ideas about what kind of net reel he is going to put on, where he's going to put the winches, and where the net reels will be positioned on the boat. There are so many variations in the New England fleet that even two sister vessels look different because of the deck arrangements.

So that will be our area of concentration over the next 12 months. We still have fishermen who ask us to do specific work, which I feel we really can't get into. If we provided a free service, we'd be treading on the naval architects' toes. We are stuck with legal implications that keep coming up. What should we do about this?

I have found that fishermen are really interested in stability. They're shy about coming forward because if they ask us to do experimental work on board, we're providing a public service and therefore the information is public and the insurance company may hear about it. The skipper may risk losing his insurance or having his premiums rise.

But at all our forums and seminars we have had fishermen sidle up and ask questions about stability. They want to know how they can check their vessels' stability without anyone else knowing about it. It's difficult to answer questions like that when you're providing a public service. But there are ways. Bruce has talked about the

traveling road show. We have a movie that was made in England some years ago and is a very good educational movie for fishermen.

Another problem I can see growing, particularly on the East Coast, is one that came up in the United Kingdom about eight years ago. Trawlers that were built with very good stability criteria, because of the law, were diverted into another fishery. Up to that point they had been ground trawlers. Then when regulations were put on ground fishing to divert them into another fishery, they went into the midwater trawl fishery for mackerel, and they were handling loads in the cod end they'd never handled before. Up to that time, they'd been taking maybe five or six thousand pounds in the cod end. Suddenly, after half an hour, they were picking up 50 to 60 thousand pounds, and the only way they could handle it was to bring it around the side of the vessel. They really didn't understand what was happening when they tried to lift such great weights from a boom. Two or three vessels went over in very calm seas. Of course, it led to inquiries being held, and the next step was an educational program for fishing masters and captains who had to handle the new species and these new heavy weights at sea.

Now the same species are ripe for exploitation on the East Coast. These changes in gear are going to come about, I'm sure. We've already seen the squid boom this year. How long will it be before the mackerel boom comes along? It will be a problem we'll have to face sometime, particularly concerning vessels that may have shaky stability now and are going to be handling bigger deck loads and greater fish room bulk loading. I feel it is our job really to educate, as well as to develop projects to verify stability or design. We have to educate the user group, the fishermen themselves.

## DISCUSSION

Klotz: I know from the casualty reports that almost every time there is a capsizing somebody has fooled with the weights. A new winch has been added or changed. Somehow or other there have always been weights added. Is there something we could do in an advisory form that would suggest that engineers who install these weight were liable?

Amos: It's not really the engineer's fault. The fisherman tells him how he wants his boat.

Klotz: But the installer has no obligation to see whether it can take the added weight stability-wise?

Kowalski: The problem is that he doesn't know the baseline. He doesn't know where the center of gravity is at the time. So if he adds something there is no way of determining how it will influence overall stability. The first thing to do is to get the basic stability information on each boat.

Klotz: Have there ever been any liability cases where someone has been sued for installing too much weight on deck?

Harrison: The insurance company will pay under one clause: negligence. Captains, crew members, engineers are covered for negligence in your hull policy and your P & I policy. If you tried to hit them with lack of due diligence on the part of the owner, it would be thrown out. The owner is not an insured peril.

Adee: Couldn't the insurance company sue the shipyard or whoever installed the gear?

Harrison: They could take the captain to court.

Adee: Why not the shipyard?

Harrison: It's not the shipyard's responsibility. The yard installs what it is told to. It is an unregulated industry.

Tyrrell: Do classification societies ever enter the picture, as far as the insurance companies are concerned?

Harrison: No, not on fishing boats.

Tyrrell: The merchant fleet had the same situation the fishing fleet has now, and they evolved the classification society to establish better stability and overall safety. Couldn't the same sort of evolution take place in the fishing fleet?

Harrison: You must have the requirement imposed by a higher authority, and there is no higher authority.

Tyrrell: My understanding was that the American Bureau of Shipping evolved voluntarily; it wasn't mandated by a higher authority.

Harrison: There are a few boat owners who will have an ABS surveyor appear periodically to see that the yard is building in accordance with the specs. But these may be very, very limited and very, very general.

Lassen: I have to disagree with Mr. Harrison, because I think we're starting down that road. While we are way behind the maritime industry, fishing industry people did voluntarily get together in 1978 with the insurance people. I think there is an interest within the community to do something we have been working toward together and we seem to be moving in the right direction. So I don't think it takes direction from a higher authority.

Harrison: In the last ten years, I have probably had two sinkings as a result of capsizing. I've had probably 800 to 1,000 hull claims, maybe 12 to 15 losses a year. Stability has not been our problem. It's flooding and sinking.



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PRESENTATION: FLORIDA INSTITUTE OF TECHNOLOGY

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John C. Sainsbury  
Professor, Department of Ocean Engineering

I would like to explain how we got started and some of the work we have in progress at the Florida Institute of Technology. We got interested in stability, with the support of Sea Grant, because of the number of losses at the local port, Port Canaveral, which is right next door to the Space Center. This port is home for a fleet that varies from about 17 at times to over a hundred vessels working the calico scallop fishery. Most of the vessels are converted shrimpers. They come into the scallop business with very few modifications, except for the nets which are heavier and somewhat smaller. But they use essentially the same fishing technique as the shrimp operation. They all have the big double shrimp outriggers. They are somewhat old and battered vessels, a mix of wood and steel. In addition, there are two or three 96-foot vessels with processing facilities aboard.

Usually, the vessels bring the scallops aboard and pile them on the afterdeck. They operate with virtually no fuel or water because they can't afford the weight. This means the vessels sometimes come in with the forefoot out of the water. They will come into port with nothing in the hull and up to 50 tons of scallops right on the afterdeck. The result, of course, is that the vessels sit down on their backs. They have a reduced waterplane and a very high center of gravity.

Reports that can be pieced together indicate that the vessels very often come in with a big load of scallops on the back, running at sea with their outriggers out, and when the outriggers come up, just as they turn to come in alongside the key, they flip right over. We were pretty certain what was causing the problem. Our aim was to look at the educational aspects and decide whether to put on workshops for the people involved in the fishery.

We're only effectively six months into the project, instead of the eight or nine we should be. At the moment, we are putting together a visual display of what happens to these vessels that we can take around to the various seminars we intend to hold during next year. We're also getting a model of a vessel so we can prove to fishermen that what they see happening to the model is what actually happens in real life. We have an advisory committee made up of a local insurance broker, a person from the Farm Credit Association, a local Sea Grant agent, and a naval architect from Jacksonville who has done quite a bit of stability work on these vessels. There is also a shipbuilder, representing one of the yards that has built a lot of these vessels.

Just as we were starting our work, the fishery dropped off. It was also the wrong time of year for scalloping, so we were delayed in getting our people out on the boats to document operating and loading procedures. However, we have been doing that in the last two months. Any doubts people had about whether our work was necessary have been dispelled, because another vessel tipped over just the other day.

There have been something like six or eight of these losses altogether.

Insurance companies have become sufficiently interested in this problem to see that most of the vessels that have been casualties are raised. But the insurance companies will not insure them again until they've had a complete stability check. This is done by commercial companies based in Jacksonville. Our part in this, we hope, is going to be mainly to make people more aware--to act as an advisory center. We hope this will extend throughout Florida via the Marine Advisory Service. At the moment, we are concentrating on the scallop fisheries. We are trying to classify the vessels into various groups, determine their stability, and show fishermen exactly what happens.

Next May, we are putting on an international conference on the design, construction, and operation of commercial fishing vessels at FIT. It will be sponsored by the southeast section of the Society of Naval Architects and Marine Engineers and by Sea Grant. One session will be devoted to safety of fishing vessels. Invitations are going out to Europe, the Food and Agriculture Organization, and developing countries through the AID missions and the developer banks. We're including sessions in the conference on vessels for developing countries and small-scale fisheries.

There will be two publications, one of papers received before the actual conference, up to the middle of March, and another including all the papers that were given at the conference or came in late, together with written contributions. I might mention here, on the subject of training people in vessel stability, that the program in fisheries and marine technology, which I directed at URI for ten years, did just that. As a result, there must now be at least 150 fishermen around the country who have had a background in stability.

## DISCUSSION

Kowalski: Are you planning some research on the scallopers?

Sainsbury: We are doing research from the point of view of being able to display the loading conditions and stability. Later, in conjunction with Harbor Branch Foundation, a private, non-profit group, very close to us, we plan to do some work on sea-keeping, which can be extended to fishing boat models. But this is at least a year away. At the moment, it is all static stability, aimed at providing an education and guidance service for the local people in the fishing industry.

Keener: Do you feel from what you have seen so far that any scalloper can make a profit loading safely? Can you put a deck load on there that keeps the vessel within limits and still make a profit?

Sainsbury: I would say in very few cases, from what we have seen so far. Really, we have not done an extensive enough survey yet. We are still using typical vessels to make sure our computer tells the truth. I do have two groups of students working on ways to reduce the load on the afterdeck, by means of initial sorting at sea. At present, the loads are live scallops combined with mud and shell, which sometimes make up 75 percent of the total landing.

Tyrrell: What is the size of the scalloper?

Sainsbury: The regular vessels are between 60 and 80 feet. The two or three larger ones with on-board processing are about 90 feet.

Kowalski: What do they do between scalloping seasons?

Sainsbury: They convert. Some go to swordfish, some to shrimp.

Kowalski: Are the shrimp boats stable?

Sainsbury: I would say they are. You rarely hear of a shrimper having stability problems. It is a different sort of operation, where a relatively small amount of high-value fish is being put below as opposed to a very large amount being stacked on the afterdeck. Nobody knows how much of the load is salable. It is a specific problem of vessels which were designed for another purpose being converted and used, I feel, in an unfortunate manner.

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PRESENTATION: NATIONAL TRANSPORTATION SAFETY BOARD

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W. Douglas Rabe  
Naval Architect  
Bureau of Accident Investigation

Basically, what we do at the Safety Board is investigate transportation accidents. These include aircraft accidents, highway accidents, pipeline accidents, and railroad and marine accidents. Don Tyrrell and I are from the Marine Accident Division, and we typically investigate capsizings, sinkings, collisions, along with the Coast Guard, if the accidents are major casualties. While we get many reports of fishing vessel casualties, we don't investigate many, usually because the dollar value, as compared to some of the large accidents, is not quite so high or, thankfully, people have not been injured or killed.

A problem we have is getting all the information we need for a complete investigation, because after a bad fishing vessel accident there's often no one left to talk to and no boat to see. When we do an in-depth investigation, we usually write a report of 10 to 20 pages addressing safety recommendations to those people who might be able to prevent similar accidents in the future.

We run into problems here, too, because sometimes there is no really good place to send such a recommendation. The Coast Guard has limited regulations for fishing vessels, and we find owners are often reluctant to reply to us or implement recommendations because they are afraid of the liability aspects.

Nevertheless, we continue to investigate, as we are required to by statute, and hope that our investigations, reports, and recommendations will help to promote safety.

I guess that, of all the major accidents we investigate, fishing vessels comprise only five or ten percent. But still I think it is an important part of what we do. I would like to ask all of you here how we can improve our program and how we can assist you in your endeavors to promote fishing vessel safety.

#### DISCUSSION

Shephard: You have your own regulations, your mandate as to what you can and cannot do. How does that pertain to fishing vessels?

Rabe: Strictly speaking, we investigate accidents that are termed major casualties, defined as those involving loss of life by six persons or more, half a million dollars or more in property damage, or serious threat to life by hazardous materials, which generally is not connected with fishing boats. Boats up to 125 feet commonly have a crew of less than six, so even if a vessel and all the crew were lost we might not get involved. The dollar limitation is often another cutoff point for us. If an accident does not meet these criteria, we usually don't get involved, although we can, if there is some particular interest or safety message in a specific accident. What we do, and hope

is effective, is distribute reports of those cases we investigate so that people can learn from them.

Shephard: How would someone who might want the report be aware it was available?

Rabe: We do have a problem getting our information out to people who could benefit from it. I would like to ask the people here to help us.

Morani: Do you have a mailing list people can get on?

Rabe: Right now, we are mailing our reports to anyone who asks for them, provided the requestor is a non-profit organization or agency. That is, we maintain a mailing list of those people. If anyone else calls us for a particular report, in general, we will send it. We don't maintain a large mailing list of individuals to send every report to. We do have a subscription service through the National Technical Information Service.

Sainsbury: Have you any idea how many fishing vessel reports you have done in the last five years?

Rabe: I would say we have written comprehensive major reports on perhaps five or six and shorter reports on around twenty.

Harrison: Who initiates the request that brings your outfit into the picture?

Rabe: We rely on the Coast Guard for notification. If the accident meets our criteria, we make a decision whether we will participate with them in an investigation or not.

Harrison: Up in New England, we have had quite a few boats that have not come back, 6 men, up to 13 men lost. I know of no case where the National Transportation Safety Board has come in for any investigation.

Rabe: We did investigate the Lobsta I a few years ago, but you are right; we have not been in New England very often.

Keener: How do your reports differ from those of the Coast Guard?

Rabe: I think the Safety Board is a little freer to make recommendations where they are necessary. For example, if a Coast Guard search and rescue effort is involved, the Coast Guard is in a way reporting on its own activities. In general, I think it does a fine job of that, but we are totally separate and we can assess the Coast Guard's activities with impartiality. We might choose to develop an area of an investigation that was either not important to the Coast Guard or that they overlooked. I think you might also find some differences in where we address recommendations. Typically, when the Coast Guard writes an investigative report, their recommendations for future action do not go to private parties, whereas ours often do. The Coast Guard often makes recommendations to itself--change a regulation, do something along that line. We are not at all averse to sending our reports and recommendations out to fishing vessel companies or owners, which the Coast Guard typically does not do.

Keener: Are not all aircraft accidents, no matter how minor, investigated by the Transportation Safety Board, whereas a quarter-of-a-million-dollar vessel that lost three people might not warrant a report?

Rabe: Yes and no. We are responsible for investigating all aircraft accidents, but, in fact, we do not. We delegate the investigation of some of them to the Federal Aviation Administration. So

in that way it is similar to what we do in the marine field. We request the Coast Guard to investigate many marine accidents for us. The Coast Guard investigates all marine accidents, and we investigate only some, along with the Coast Guard.

Adee: Is there a difference in the depth of the investigation? The cases you come in on are so significant generally that an in-depth investigation is warranted, yet the typical fishing vessel reports from the Coast Guard are much shorter and don't necessarily include stability calculations and all the other things you might get into.

Rabe: I think we all have to realize that there is a question of cost-effectiveness, and while the NTSB employs some 300 people to investigate transportation accidents, only about a dozen of us work in the marine field. The Coast Guard has a similar problem of having to spread itself thin.

Adee: A question for both you and the Coast Guard: do you think if fishing vessels were licensed you would tend to investigate accidents more thoroughly and try to determine the cause?

Klotz: I think there is a good possibility we would, because we are naturally more interested in the vessels we are responsible for, and we are not responsible for inspection of fishing vessels.

Keener: Is there any chance of resurrecting the Coast Guard program that was discussed several years ago to appoint 20 new officers to the Marine Safety Office to inspect unlicensed vessels?

Klotz: Not at any time in the near future, because the government is cutting back to bare bones.

Smith: Did I hear you say you do not license fishing vessel personnel?

Klotz: Yes, although I should qualify that. There are some license requirements. The operator of a vessel over 200 gross tons must be licensed. When I said that, I was speaking in generic terms. Fishing vessels over 200 gross tons are a definite minority.

Adee: Is there also some sort of exception for processing vessels?

Klotz: Fishing processors have been exempted until January 1988. Those vessels under 5,000 gross tons are exempt from inspection and licensing of crew members.

Adee: Would that include a vessel that moored at some place and processed, then carried the fish as cargo to another point?

Klotz: I think the law specified "processor," and I think there is a very gray area in their definition because a number of vessels fish and process or process and carry.

Smith: I think if you check the Fisheries Conservation and Management Act, there are some definitions of processing. There is an implication that supply and transportation activities in support of fishing or processing are included within the concept of processing. So, though there may be disagreement as to exactly what their status is, when they are transporting a finished product there is an argument to be made under the FCMA that they are still processing vessels when they are engaged in that activity.

Adee: One of the problems we have had has been fires. If the processing vessels, in particular, had to meet flammability standards for ordinary merchant vessels, would that not have eliminated many of these polyurethane and other types of fires we have had aboard processing vessels?

- Klotz: I think it would, because if they were under the inspection laws, the polyurethane would not have been allowed.
- Harrison: I would like to address a question to Mr. Ostenso about weather forecasting in our area. About a year ago, a very bad storm hit the New England coast off Georges Bank. In our small office alone, we had ten hull casualties. There is only one marine forecaster in the Boston weather office and he works five days a week. He was off when the storm hit. During the entire weekend, the forecast was never updated.
- Ostenso: Dick Hallgren is aware of the problem and he is trying to work with Sea Grant to expand his meager resources of personnel and dollars to provide the best public protection that he can. No one knows better than Dr. Hallgren that the Weather Service has only one marine forecaster in the Boston area.
- Amos: I might add that the storm precipitated the New England Weather Forum. The whole New England weather-reporting system is under close scrutiny by the users.
- Harrison: All the fishing organizations were upset about the way New England was shortchanged. Everybody else has at least three marine forecasters in the big weather offices and there was only one in the Boston office.
- Ostenso: Of course, the solution you would like to have for these recognized problems is to have the resources to do the job properly.
- Kowalski: You mentioned the budget. What is the prognosis for Sea Grant, and university programs especially?
- Ostenso: I think the prognosis is about the same as the Marine Administration's or the Coast Guard's. It is uncertain. We are still operating under a continuing resolution. This year, for the first time in three years, we expect to have a budget. But we are doing the best we can under the circumstances.
- Kowalski: There is no more talk about phasing out the Sea Grant Program?
- Ostenso: Oh, lots of talk, but there is always lots of talk about lots of things. Clearly, this administration feels that some adjustments need to be made, and I am not unsympathetic to that. The way I look at it is this is going to be a shaking out and reassessment. The programs that survive this trial by fire are probably the ones that ought to survive. I think the Sea Grant Program is going to look back on this period as making it a stronger, healthier program.
- Shephard: A subject that has been touched on several times today is liability. How do we handle it in our Sea Grant reports?
- Ostenso: Well, that is one of the real strengths that the university program, not just Sea Grant, can bring to these kinds of issues. When the government makes a statement (or chart, for instance), there is the public perception, and indeed a legal basis, rudimentary credibility, and implied warranty. On the other hand, when a university scientist makes a statement and produces a product, it is recognized as his personal assertion without real or implied warranty (within the bounds of libel, slander, or deliberate fraud) to himself, his institution, or his state. This makes it possible for academia to do some things that government cannot do at all or not nearly so effectively. If Captain Klotz writes a letter on Coast Guard stationery, it

carries the full baggage of a government position and would carry certain freight in court, whereas if Professor Pasquale writes a letter on OPU stationery, the public perception is that it reflects his personal view. If a university employee makes a statement in his best judgment, the only thing that might be in jeopardy is his personal reputation. So that is why a lot of areas involving vessel safety can be much better handled by the academic community than they can by federal employees.

Adee: Are we talking about a report, for instance, from the University of Washington, that comes out with a Sea Grant label on it and is used by someone as the basis for modifying his vessel? Suppose the report completely ignores stability criteria and the vessel capsizes? Under those circumstances, would the university or the Sea Grant Program be liable?

Ostenso: My guess is that the government would not be liable because it is a grant and not a contract, and I am not even sure they would be liable if it were a contract. It is not a government publication; it is a university publication. It does not have to be cleared with a governmental agency. I do not think there is any history of universities being liable for technical advice given by any of their faculty or employees. A lot of my colleagues at the University of Wisconsin were expert witnesses in court cases and I am sure it was never implied they were there other than as individual experts. They were not spokesmen for the university.

Smith: I would like to ask why Sea Grant would become involved in something like fishing vessel safety?

Ostenso: The principal aim of Sea Grant is to focus on an objective rather than a discipline and to bring together the diversity of talents that are required to meet that objective. We consider fishing and marine transportation important parts of the national marine economic sector and fishing vessel safety an important element of these industries. Because programs in the national Sea Grant network have been addressing vessel safety, we at the national level are trying to bring it all together to make the parts a stronger whole. It fits what we think we are established to do and where we may be able to make a significant contribution to the nation's economy and well-being.

Klotz: I think Sea Grant's mandate and that of the Coast Guard are quite different. The laws we operate under are primarily responsive. We respond to certain stimuli: investigate an accident, inspect a vessel, conduct search and rescue operations. There is not so much research and planning ahead, which I think is, quite properly, more in Sea Grant's area.

Adee: Our safety center at the University of Washington probably was one of the first ones. I would like to thank the Sea Grant Program for having been willing to take a chance on funding a program that might be able to prevent accidents. There would not have been a meeting like this one today without Sea Grant.

Smith: Do you have any plans in other areas of vessel safety?

Ostenso: We might in the future. We are willing to go where the need and the opportunity are. One of our closer associations is with the fishing industry. Our relationship with the marine transportation industry is not that strong yet.



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PRESENTATION: NATIONAL COUNCIL OF FISHING VESSEL SAFETY AND INSURANCE

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Thor J. Lassen  
Executive Secretary

The National Council of Fishing Vessel Safety and Insurance was formed in 1978 and represents all the major sectors of the fishing industry. Our membership is wide; it touches on all the coasts and practically all the major fisheries. The Council was initiated to coordinate the development of a nationwide program aimed at reducing not only the loss of lives, equipment, and vessels, but also at reducing insurance costs associated with the industry.

Since 1978, the Council has produced a newsletter, which includes information on educational, training, and research activities, new safety products for fishing vessels, new legislation, regulations, and safety standards. In general, it provides the marine community with a forum it can use to raise various issues. If any of you with the Sea Grant Program want to use the newsletter to get information out to the fishing industry, please give me your material and we will try to publish it.

In 1982, we set up a Washington office, and submitted a funding proposal to the Saltonstall-Kennedy program. Some of our original concerns have already been mentioned today. One that has not was the idea of studying the relationship between crew experience and fishing vessel accidents. Icing on fishing vessels in the North Atlantic and North Pacific was another area we tried to obtain funding for. Human factors in fishing vessel design was also of interest to the Council. There have been a number of studies attempting to improve the design of merchant vessels to provide a better operating environment for people. We hoped to transfer usable data to fishing vessels. We are also planning to review alarm systems: their number, effectiveness, etc.

The fourth area we are interested in is the effect of fisheries conservation and management on human safety. The largest body of government regulations applicable to the fishing industry is aimed at conservation and management of commercial species. Unfortunately, these regulations are applied with little or no regard for their effect on human safety.

An example is the pressure the fixed quota system and season closures have put on Alaska crab fishermen. Another example is the impact of the regulations establishing management zones in Puget Sound, which force an unusual concentration of fishing vessels in a small area.

In 1982 we received some funds that we used to create an information system for reporting and evaluating statistics on fishing safety, accidents, and related topics. The Marine Index Bureau is carrying out this project for us. Also in 1982, we came up with a comprehensive marine fishing casualty report. Most of our information came from the insurance community. We are now in the second phase of this study.

Another program we are about to start has to do with disseminating information to the marine community. With federal support from

the S-K program, we will distribute a monthly column for industry trade publications in which we will include information about crew and vessel safety.

We are going to initiate a regional survey, mainly of the fishing industry. We are interested in finding out what each group of vessels is doing in terms of safety programs. For example, the Tuna Boat Association produced a manual to help their fishermen survive under different conditions. The North Pacific Fishing Vessel Owner's Association has hired a safety officer, and will be producing a manual and seminar series. In New Bedford, they have a Fishing Vessel Safety Council.

If we can find out what everyone is doing in each region of the country and pull them together, perhaps we can learn something from one another and improve the overall practices used.

This survey goes out in our next newsletter. We hope to hold a national seminar on regional safety programs next spring in which each region would report on the type of material and programs available in their region and the activities their vessels participate in to promote safety. We are doing this as an industry, but I think it is also important to have the participation and response from Sea Grant because there is a close relationship between Sea Grant and the fishing community.

#### DISCUSSION

Keener: Have you worked at all with the health insurance industry?

Lassen: I am not sure.

Keener: I asked because I attended a Sea Grant-sponsored meeting in Atlanta about three years ago that brought together marine advisory programs, health insurance companies and corporations concerning the loss of public health service and free medical insurance for commercial fishermen. One of the complaints from the health industry was the lack of a data base on which to make actuarial tables. Up until that time the Public Health Service had simply taken care of it. Fishermen across the country still have a problem getting health insurance at reasonable rates because the insurers do not have the figures they need to work from.

Lassen: We have some information that indicates types of injuries, but I am not sure whether this information came from health insurance companies or other sources contacted under our casualty survey.

Kowalski: Isn't the Marine Index Bureau collecting this sort of information?

Lassen: Yes, that is the group doing the survey for us.

Kowalski: But they have a survey which is for the ship owners' benefit, haven't they?

Lassen: That is the merchant marine community, not fishing. They operate on a subscriber basis. For a company participating in their program, they will help in the evaluation of insurance claims.

Harrison: Are we talking about the individual fisherman buying his own insurance or the boat owner buying insurance for the crew?

Keener: We looked at both options. In South Carolina, we are just now looking into what the Massachusetts Lobstermen's Association has done.

Harrison: They are about the only outfit to make the plan work.

Every one of the major insurance companies around the country has lost money every year on P & I. They make very little on hull insurance. They would prefer not to write fishing boats. For them, dealing with commercial fishermen means dealing with the Jones Act and the unlimited lawsuits it makes possible. In New Bedford, the seafood producers got together with the union when the Public Health Service was phased out. They were afraid their P & I insurance would skyrocket. It has not. But they got group insurance, and they estimated a certain cost and were wrong by about 200 percent. It was much higher than they had anticipated. So I don't think they are going to participate next year.

Adee: In Alaska, commercial fishermen must be licensed. Part of the fee goes into a fund for emergency medical benefits. It is not a comprehensive plan.

Tyrrell: I take it the Department of Labor has nothing to do with working conditions on board fishing vessels?

Amos: OSHA has some regulations on vessels over 50 tons. But there are very few exceeding 50 tons on the East Coast.

Adee: Don't they also have a memo of understanding with the Coast Guard?

Klotz: There is a memo, yes. Essentially it says the Coast Guard has jurisdiction over the vessels, while shore-site facilities, industrial accidents in shipyards, and that sort of thing remain under OSHA.

Kowalski: What are the future plans of your organization?

Lassen: We are continuing our survey of casualty data, using the form we developed in 1982. We are trying to understand the conditions under which accidents occur. Once we have some of that data, we will be able to develop recommendations Council members can carry back to their individual vessel associations to improve safety practices. There is a hope they can use some of this information to work with insurance companies and lower some of the costs of covering vessels. That program will probably continue for a year or two. We will continue the newsletter. It goes out to a little under 500 people on a quarterly basis. And we try to keep the fishing community and others advised of what is going on in the field of vessel safety. We will provide a monthly column to the trade press devoted to fishing vessel safety. I mentioned the regional survey. We may also go back to some of the other concerns I mentioned that we did not get funding for in the past.

Tyrrell: You mentioned something about conducting studies like the human factor study. How available are they?

Lassen: I mentioned five projects we were initially interested in. We only received money to carry out two of them. So the study on fishing vessel design has not been done. Perhaps we will be able to do it in the future.

Tyrrell: Have you conducted any safety-related studies?

Lassen: Only in terms of gathering casualty data and the circumstances under which casualties occur.

Rabe: Is that data in a form usable by others?

Lassen: It was published as preliminary data earlier this year in our newsletter. We want to upgrade it, improve on the response we got from the insurance people, and decide how we can use it.

Goudey: How big a group does your office represent? How many people are actually doing the work you describe?

Lassen: We operate under a board of directors, which is made up of the major U.S. fishery associations. I provide staff support and do most of the legwork. The Council has the support of practically the entire fishing industry, but I can't tell you exactly how many people are involved through all these associations.

Goudey: What information do you have to date that would be available to us in this room?

Lassen: Well, I think to date we are not really happy with the response we have gotten so far in terms of total amount of data, and that is why we are beginning a second phase and why the National Marine Fisheries Service gave us additional funds to carry the project forward. Data were lacking from specific regions that we felt were significant. Our efforts now are going to be to get some better response from specific areas and groups.

Sainsbury: I have the impression you tie in with the insurance industry. Is that true?

Lassen: The Insurance Company of North America and some East Coast companies are on our board, and there are some lawyers who are pretty active in insurance claims. So our membership is not just the fishing industry. You know, our original intent was to get the two groups together.

Harrison: Marine insurance companies would be your best source of data. Very few vessels fill out the Coast Guard report unless the Coast Guard has furnished rescue assistance. Do you have a copy of the latest booklet put out by the First Coast Guard District? It is updated and very good--a really good book for every fishing boat.

Cullather: Are you going to survey your insurance members to find out what they think can be done to reduce risks and lower premiums?

Lassen: The survey is not asking that. It is really asking for information concerning claims they process. We are trying to build a data base to understand the conditions under which accidents occur, where they occur, and what type of vessel is involved.

Cullather: Are you asking for the amount of awards?

Lassen: Yes, we are.

Kowalski: Does one have to be a member of your association to receive all this information?

Lassen: No, it has been published in our newsletter. But we are trying to encourage people to participate as members. We do ask for a minimal fee to support our activities.

Montgomery: How big is your distribution list?

Lassen: We have a distribution list of about 450, and I think last year was the first year we asked for dues.

Kowalski: Did you say fishing vessel insurance is a very small part of the companies' operation?

Harrison: Of the total picture, yes. I am sure the companies feel that tugs, barges, containerships, supertankers that are very safe will cover the losses of the fishing industry.

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PRESENTATION: U.S. COAST GUARD

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Tony E. Hart  
Lieutenant Commander  
First District

I have been asked to tell you what we do with the casualty data that is submitted to us. By law and regulation, merchant vessel casualties are required to be reported to the Coast Guard, and this includes fishing vessels. At headquarters, we maintain a vessel casualty file. The existing, computerized data base goes back to 1963. There have been some problems, as alluded to earlier today, with the data base. We have made some improvements in the last year or so. A better casualty program is now in operation and on file, starting with data for 1981. The following areas are being looked into:

1. An analysis of fishing vessel casualties between 1970 and 1981 or 1982. We are going to concentrate on total losses. It has been mentioned that a lot of fishermen do not report casualties. We feel we have got a better handle on casualties that involve a total loss.
2. Casualties involving documented fishing vessels. These are vessels of five net tons and over. We are now going to look, at least initially, at the state-numbered, state-registered fishing boats. We will be trying to develop casualty rates. Instead of just giving the number of vessels lost each year, which we can do right now, we are going to develop casualty rates based on the vessel population, say ten vessels lost per thousand of that type.
3. Developing casualty rates based on the aging of vessels to see whether age of the vessel affects the casualty rates. We are also going to look at major types of hull, what the rates are for steel, wood, and fiberglass.
4. Developing fatality rates on fishing vessels as a result of casualties and accidents. Once we develop these fatality rates, we hope to be able to compare them with other types of industry.
5. Looking at foreign fishing fleets. We have received casualty statistics published by some of the major fishing countries: Canada, Norway, the United Kingdom, Denmark, and Japan. Initially, it appears our losses are not too different from those faced by other countries. The main type of accidental death on fishing vessels is falling overboard. That is true here, as well.

Some of the problems we are running into involve a correlation between the time of exposure to work and casualty rates. We are using vessel populations, although it would probably be better to get miles traveled and total hours in operation because some of the vessels are laid up during specific times of the year. But those types of exposure methods are just not obtainable. It is difficult enough to get vessel populations. The Coast Guard has some figures, NMFS has some figures, and they are quite different.

Additionally, we would like to develop some population estimates for various types of fisheries. But I am not sure if that is going to be possible.

Personnel employed. That is another area of difficulty in developing fatality rates. About the best you can do is guess, compare numbers, and hope you are somewhere in the ballpark.

I would make one last observation. I would like to point out that stability problems are not the only problems resulting in vessel losses. I think they are a very large part of the problem in certain fisheries. But fires are a major problem. Flooding is a major problem. There are a lot of things besides stability we should be aware of, and that is essentially what the Coast Guard is looking into right now.

#### DISCUSSION

Tyrrell: When is this study slated to be available?

Hart: I am not sure. We hope to put together a paper for the spring meeting down in Melbourne and have it available around that time.

Tyrrell: Will the study look at accidents from the standpoint of how many could have been prevented had the vessel been inspected?

Hart: No, that is very difficult.

Kowalski: Flooding accounts for a large percentage of casualties. What starts as flooding turns into a stability problem very quickly. So you cannot really divorce these two. I wonder whether you will be separating the different kinds of problems?

Hart: Since 1963, we have divided casualties into six or seven categories, including flooding.

Goudey: Will there be an opportunity later on to expand your data beyond the cases that were total losses?

Hart: I think so.

Adee: I think the Coast Guard has far and away the most extensive data base of anyone, and over a longer period of time. But I would like to point out a couple of things that might skew the findings. One is the change in reporting criteria. Another is the feeling fishermen have that since they are no longer getting free health care they should not be documented. I think the point you mentioned about casualty rates is a critical one, both from the injury and the total loss point of view, and it is probably one that we will never get a good handle on because of the changes in the number of days the fishermen are allowed to fish every year, and we do not know how many people are on board the boat. One thing that I would recommend, and this comes from reading the casualty reports: I think there is a tremendous wealth of information contained in those and that perhaps the most benefit that could be gained would be by simply getting that information into a more public forum. If you read through them, they are just incredible.

Klotz: What would you suggest as a public forum?

Adee: Maybe just publishing them in Fisherman's Digest, Fisherman's Gazette, or some similar trade magazine.

Klotz: We publish them in the Proceedings of the Merchant Marine Council, but I doubt this will invite readership by the fisher-

men. We also give some of them to the fishery publications that you mentioned. So some are published, but I agree with you-- there is a lot of interesting and very valuable information in our files that is never published.

Adee: An incredible sequence of mistakes are pointed out in these casualty reports.

Klotz: Yes, there are. I would like to get those out to the public myself, but I don't see a vehicle for doing it.

Sainsbury: Fish Expo.

Lassen: I think that is one of the purposes of our newsletter, which is to get some information out to the public. As a matter of fact, at our board meeting, the Coast Guard representative did mention your proceedings as a good source of information.

Adee: How about a fishing vessel casualty of the month? They do that in the aircraft industry. Somebody within the Coast Guard could take the responsibility to put it into readable English and make it available as a press release to all the trade publications.

Klotz: I like that idea, but it takes quite a bit of time, and, like everybody else, I don't know if we can afford to do that or not. We do it to a certain extent by publishing them in the proceedings.

Adee: From the point of view of what is going to benefit fishermen most, I think the casualty of the month would probably touch the individual fishermen most.

Klotz: I believe National Fisherman prints a casualty case most every month. I know that every time I read it, it seems there's one there. I don't think we feed them the information directly.

Adee: But usually your investigations are concluded well after the public interest in a particular case is long gone?

Klotz: Yes, unfortunately.

Smith: I would like to say something at this point about the book we passed around. I know those of us who work with the Merchant Marine and Fishery Committee have heard a lot about that book, and the question I have is why is it that only one district in the Coast Guard, out of 12, has a popular handbook for fishermen? I don't understand why it isn't being published as a Coast Guard-wide publication.

Klotz: I think the genesis of that publication is that it was done jointly by somebody in the First District and a civilian who lives in Chatham, Massachusetts. Quite a bit of that work is his. Had it not been for him, it probably would not have been done. It was a unique situation. The First District published it and sent it out to all the other Coast Guard districts. I believe the other districts are republishing it. It was designed so that they could just take the cover off and it would no longer be a First District publication--it would be essentially a Coast Guard publication. I know Alaska, Washington, and Florida are republishing it.

Smith: Was your office here in Washington putting any work into making sure that it is widely available and gets updated?

Klotz: Headquarters does not have staff to do that. We don't have the budget to print or distribute a publication. Obviously, the Coast Guard is interested in the subject; we all have an obligation to promote safety in the seas. But this was developed by an individual in the First District who probably gave quite a bit of

his own time and a civilian who did the same. I don't know where the funds to print it come from.

Harrison: A few years ago, the First District put out an excellent monthly sheet. It was a search-and-rescue case file. It listed all of the vessels and the types of casualties. This was outstanding. But, again, because of budget and people limitations they had to terminate the effort. National Marine Fisheries in Gloucester picked it up for about a year. They ran into the same problem. Because of budget limitations, they no longer put it out. So some civilian picked it up, and he published it for something like \$12 or \$15 a year, and I know many people subscribed to it. About two or three months ago, he stopped publishing it. This was an outstanding source of case records. Often we found vessels we insured that had suffered casualties and never reported to us.

Smith: How much industry participation are you asking for or receiving in doing your study? How much contact do you have with the industry in making recommendations or developing some kind of safety guidelines?

Klotz: What we are doing is strictly in-house. We are going through our own files trying to find out exactly what we have and how we can put it into a useful format that will be of more benefit to everybody. If somebody wanted to come in and take any of that information, what they did with it would be up to them. It could be published. It is certainly public information.

Kowalski: Any more questions? Then this completes our proceedings for today. See you tomorrow morning.



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**SUMMARY**

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At the final meeting, November 10, 1983, it was agreed:

1. An informal association of the existing fishing vessel safety bureaus should be established consisting of the University of Rhode Island, the University of Washington in Seattle, and the Florida Institute of Technology. Other bureaus will be included as they are organized.
2. The bureaus will cooperate closely with the National Sea Grant Office, the U.S. Coast Guard, and any other organizations working in the area of fishing vessel safety.
3. The activities of the bureaus will be concentrated on education, training, advisory service, information-gathering, and research.
4. The association members will look into the possibility of publishing and distributing U.S. Coast Guard casualty reports. Bruce Adee volunteered to handle the first few. The feasibility of hiring a free-lance writer to get nationwide coverage was also discussed.
5. The feasibility of equipping bureaus with visual aids, films, and stability demonstrations will be explored.
6. There will be an investigation of areas of interest through the U.S. Coast Guard, Society of Naval Architects and Marine Engineers, National Transportation Safety Board, National Council of Fishing Vessel Safety and Insurance, Marine Index Bureau, and the equivalent foreign organizations. The aim is to learn what is being done in vessel safety research and what needs to be done. Tad Kowalski volunteered to start this investigation.
7. There will be meetings at approximately yearly intervals. The next meeting will be at the U.S. Coast Guard Headquarters, Washington, D.C., in November 1984.

Any comments, suggestions, or proposals may be addressed to:

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