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RESCUE

CHAPTER NINE RESCUE

A critical analysis of any component of a national search and rescue program requires a review of the whole of which it is a part, since funds and resources allocated to one part are not available to the others, and it is only in the context of the whole that the quality and the adequacy of the part can be judged. In the Canadian context national should not be confused, as is often the case, with federal. While a Search and Rescue (SAR) program will of necessity subsume a very substantial and indeed a critical federal role, means must be found to ensure that private and corporate citizens as well as local and provincial authorities assume their proper responsibilities within the framework of a national SAR program.

A fundamental principle upon which a free society is predicated is the intrinsic worth of the individual. It follows from this principle, at least in theory, that the affairs of society are to be so ordered that the life of no citizen, nor of any alien having legitimate business within it, is wittingly placed in jeopardy. Furthermore, where hazards may be encountered, reasonable precautionary measures are to be taken. The corollary naturally follows that, when a life is in peril, the resources of society will be mobilized in an effort to effect rescue and the cost will not be counted before action is taken. Logic and the imperatives of a free society dictate that an effective SAR program be national in scope and in organization, for its objectives are, beyond dispute, truly national.

Many obstacles lie in the path of formulating in Canada an integrated, well coordinated, and functioning national program. There are overlapping and sometimes competing departmental jurisdictions, interdepartmental rivalries and jealousies, powerful and influential national and international corporations, the potentially fractious liberties of free citizens in a free society, and an increasing dependence by citizens, private and corporate, upon the state to do for them what they should do for themselves. These obstacles are compounded by a vast underpopulated territory, much of it comprised of difficult and often hostile terrain; thousands of miles of coastline on three oceans, two of them ice-frequented and all three dangerous, and a harsh and unforgiving climate as befits a "Dominion of the North". Nevertheless, the task of formulating a national SAR program must be faced. It needs to recognize the responsibilities of the individual and of the community; the responsibilities of industry and finally the role of the state in the process of education, in the creation of public awareness, in the enactment and enforcement of laws and regulation and in the retention of that residuum of responsibility that it alone has the resources to exercise. That residuum includes the provision of major operational systems that will ensure that the state can meet its national and international obligations; the provision of facilities and resources adequate for an appropriate level of support to corporate efforts in the event of a major disaster and the provision of appropriate mech-

anisms for effective mobilization and co-ordination of all the resources, private and public, that may become available in a case of necessity.

The first responsibility is that of the individual for self-help, for the prevention of accidents, for cautious forethought, and for concern for the safety of others. The host of small craft that ply, whether for pleasure or profit, the coastal and inland waters of Canada not only constitute the largest single source of SAR incidents but, represent as well, the most intractable problems in respect of organization and control. Those who for whatever reason expose themselves needlessly to life-threatening hazards should have no illusions about the limitations of SAR resources and no doubt about the extent to which ventures are undertaken at one's own risk. Many tragedies in the past could have been averted through the proper exercise of individual responsibility.

What is true for the private citizen is by extension true for the community in which he lives and functions. No community can exist unless its members share an obligation to protect the whole through the protection of its individual members. This implies the maximum use of local resources to aid those in peril. This is as true for the province as for the village or town. Communal obligations become all the more pointed, however, in the case of organizations such as yacht and flying clubs which, because of the nature of the activities for which they exist, will inevitably require SAR resources. Indeed, where large numbers of pleasure craft are normally concentrated, as on Canada's West Coast, they constitute the preponderant source of SAR incidents. It is not unreasonable to propose that those who create organizations for the pursuit of leisure involving hazardous activity should create parallel organizations for the pursuit of safety. In short, all yacht and flying clubs should be required to create from their own resources a capacity to rescue their members in distress. In this context the potential significance of volunteer organizations should not be discounted. Some of those efforts will be co-ordinated through the Civil Air Search and Rescue Association and others through the Canadian Marine Rescue Auxiliary. These associations are important not only in operational terms but also in terms of public education and in the promotion of safety consciousness, and their efforts should be expanded. There are those who argue, on the analogy of the Royal National Lifeboat Institution,[1] that the volunteer role should be a preponderant part of a national search and rescue system. This institution, though excellent and demonstrating the highest levels of voluntary and self-help, is a system impossible to transplant. Its success is based upon some 160 years of cultivation and its traditions cannot be exported. Indeed, it might be argued that, where deeply ingrained concepts of state responsibility and of the individual's rights prevail, the soil for the development of that system in any modern state today, including the United Kingdom, would prove to be rather barren. What can, however, be undertaken through a program of education and a firm policy of self-help is a reinforcement of individual and communal responsibilities. A measure of cost recovery would emphasize that policy.

The responsibility of industry for safety is larger and more clearly defined than that of the private citizen, the community or the private clubs. A company has a major responsibility for the protection and safety of those who work for it, in the prevention of disaster and in the provision of aid, if one should occur. The law requires and self-interest dictates that all employers, in the provision of a safe workplace and in the adoption of proper procedures, assume responsibility for taking whatever measures are necessary for the safety of their employees. In the maritime context this implies preparedness for dealing with the emergencies of a hostile marine environment through the training of personnel, the provision of means of evacuation and the development of contingency plans. Where rescue becomes necessary, the fishing

[1]The Royal Naval Lifeboat Institution is a voluntary organization incorporated for the sole purpose of saving life and property at sea. It currently maintains 257 lifeboats on station along the coasts of the United Kingdom, Northern Ireland and the Republic of Ireland.

9.1 The Canadian Coast Guard maintains a number of small boats for rescue operations close to shore. Many of these incidents involve providing services to pleasure craft owners.

and shipping industries traditionally rely upon other vessels, ships of passage or federal SAR resources. Ocean-going vessels generally report their location regularly but fishing vessels do not. The success of rescue efforts is relative to the conditions that prevail, the ships that are near, the ready availability of federal SAR resources and the accuracy and timeliness of the information available regarding the location and activities of all privately owned commercial craft operating near the vessel in distress.

Although the maritime industry in general cannot reasonably be expected to provide from its own resources a total SAR capability, the offshore oil and gas industry is different. Large numbers of its workers are concentrated at known fixed locations which are distant from shore, and where environmental hazards may become extraordinary. Like all frontier industries, it is remote from public and private services that are otherwise available to render aid in life-threatening situations. Unlike traditional maritime ventures, companies engaged in offshore drilling operations off eastern Canada have under contract extensive marine and air resources in support and a vessel is required to be at the drill site at all times on standby duty. The rigs maintain daily contact with their shore bases and information, as needed, can be readily transmitted. The availability of support vessels and the quality of the communication system provide a degree of self-help and of protection to the rig and the crew, that in practice is not possible in the fishing and shipping industries. It is therefore reasonable, that in the first instance, the responsibility for rescue in case of emergency should fall upon the oil companies themselves. This does not absolve the state of its responsibilities but recognizes the need for an enhanced role for the oil industry in a co-ordinated national SAR program.

At the time of the loss of the *Ocean Ranger*, neither the oil companies nor the federal SAR services were adequately prepared to meet an emergency of that dimension. Despite the loss of the *Alexander L. Kielland* only two years earlier, a strange euphoria was pervasive. The mystique of unsinkability inhibited the kind of planning that was clearly necessary. Most glaring among the long list of deficiencies revealed in the investigation of the loss of the *Ocean Ranger* were inadequacies in the training of the crew, in contingency plans and the training of key personnel on shore, in emergency procedures and co-ordination of rescue efforts, in the command structure, and

9.2 Fast rescue craft (FRC) provide a rapid, highly mobile method of recovering survivors from the water or from a TEMPSC. The safe deployment and retrieval of these craft, and co-ordination between the crews of the FRC and of the standby vessel, depend on training and regular drills in realistic conditions.

in the escape and survival systems. Some of these deficiencies were specific to the *Ocean Ranger*, while others were general and pertained to the industry as it then operated.

The standby vessels that at that time served the rigs on the Grand Banks, on the Scotian Shelf and off Labrador were designed to provide anchor-handling, iceberg-towing and supply services; neither in structure nor in equipment were they designed for effective rescue services. Their cargo rails obstructed rescue attempts from the sea and few had removable bulwarks to enable the crew to reach survivors. Rescue equipment was meagre, if not non-existent, and the crews had no rescue training. Medical facilities and provisions were in short supply and there were no paramedical personnel on board. The helicopters under contract had no rescue equipment, the pilots were untrained in rescue techniques and there were no trained rescue technicians available. There was no co-ordination of contingency plans between the oil companies and the drilling contractors nor with federal SAR. Senior industry personnel on shore were not equipped by training or experience to perform the duties expected of them in the event of a major disaster.

Since the *Ocean Ranger* disaster the oil industry has assumed an increased responsibility for first-line help in an emergency and significant measures have been taken to augment and upgrade equipment and procedures; yet much remains to be done. Studies have been undertaken by industry to assess the safety, survival and emergency response systems of the operating companies and recommendations made for action to be taken. When helicopters cannot be used to evacuate a rig, the standby vessel is considered, in the North Sea and off eastern Canada, to be the first-line resource to assist in the rescue and accommodation of all personnel from the rig for which it is responsible. The standby vessel is also intended, off eastern Canada, to assist in the avoidance of collisions with ice or other vessels. Closer attention has been paid since 1982 to the ability of a standby vessel to perform these functions. Guidelines now state that it should keep station no more than one nautical mile from its rig or at a distance such that the time for return to the drilling rig does not exceed 20 minutes. This is a clarification of the 1980 Regulation which specified neither an appropriate standby distance nor a return time.

The standby vessels are, however, generally unchanged; their propulsion and station-keeping abilities are adequate but their structural characteristics remain unsuited for rescue functions. Fast rescue craft (FRC) and crane-operated rescue baskets are now required and are installed. This equipment has undoubtedly improved the rescue capability of the standby vessels, but concerns have been expressed about the effectiveness of the system for launching and recovering the

9.3 The EMPRA and similar devices enable persons in the water to be picked up and transported by air to nearby rigs or supply vessels. EMPRA are kept ready for use at all helicopter bases serving the East Coast offshore, including Sable Island, and on all drilling rigs and supply vessels.

"An. . .area of concern with respect to the use of supply vessels in the standby role has to do with the effectiveness of their recovery equipment and techniques. Industry has adopted the latest, state-of-the-art equipment but industry and government agencies both expressed concerns that the level of training and development of the support vessel crews is not in keeping with the stage of evolution of the equipment."

An Evaluation of Industry Safety Management in Eastern Canada Offshore Drilling Operations. Manadrill Drilling Management Inc. 1984

FRC under storm conditions and there are also technical problems with the crane-operated rescue basket system, which need early resolution. Questions have been raised regarding the quality of training and of drills provided for the crews in launching and recovering the FRC under storm conditions.[2] Effective use of the FRC and of the rescue baskets in a storm requires a crew that is highly trained, experienced and regularly drilled. There is also the question of the ability of a normal crew complement of a standby vessel to deploy and recover the FRC, to maintain and manoeuvre the vessels, to recover survivors from the sea or from the FRC and to administer first aid. These questions and concerns need to be addressed by the regulatory authority.

Since 1982 the helicopters serving the rigs have been upgraded for rescue. They have been outfitted for a hoist which can be installed in less than twenty minutes whenever it is required and the crew is trained in its use. The hoist is used to lower a Billy Pugh basket to the sea for those survivors who can climb into it and be hoisted up, but no rescue technician is provided to help the helpless. The industry is now able to employ the emergency multiple person rescue apparatus (EMPRA), which may be suspended from a helicopter on an external hook and can hold 15 to 20 persons. Persons can climb into this apparatus from the deck or from the sea or be scooped up from the sea, if they cannot help themselves. This apparatus enhances rescue during calm weather, but the helicopter can transport survivors in it only for a relatively short distance because of reduction in the speed of the helicopter and the risk of hypothermia to the survivors. Concerns expressed regarding the effectiveness of the EMPRA under storm conditions need to be addressed. Industry helicopters can also drop standby emergency assistance (SEA) kits to aid survival.[3]

The helicopters which are used for regular crew transport are twin turbine, single-rotor aircraft, the Sikorsky S-61 and the Aerospatiale Super Puma, each equipped with an automatic flight control system. De-icing equipment, auto-hover systems, and continuous duty hoists are available, but they are not standard equipment. The installation of this additional equipment, though increasing the rescue capability, would reduce the load-carrying capacity of the helicopters. Communication, navigation and other avionics equipment is similar on both types of helicopters but the Super Puma with a cruising speed of 135 knots and a normal radius of action of 285 nautical miles is considered to be superior as a rescue vehicle because it can

[2]Only three crew members are required to receive FRC training. Practice drills in the use of the FRC are at the master's discretion and are generally conducted only under ideal conditions.

[3]These kits consist of four interconnected packages comprised of two life rafts connected by a long line with floating equipment pods. They are stored at the airports, on the rigs and on Sable Island.

reach all points on the Scotian Shelf and on the Grand Banks without refuelling (Appendix D, Item 3). These helicopters under contract to the industry constitute a secondary source of SAR resources in the event of a major disaster. Their crews need to be trained regularly in rescue functions.

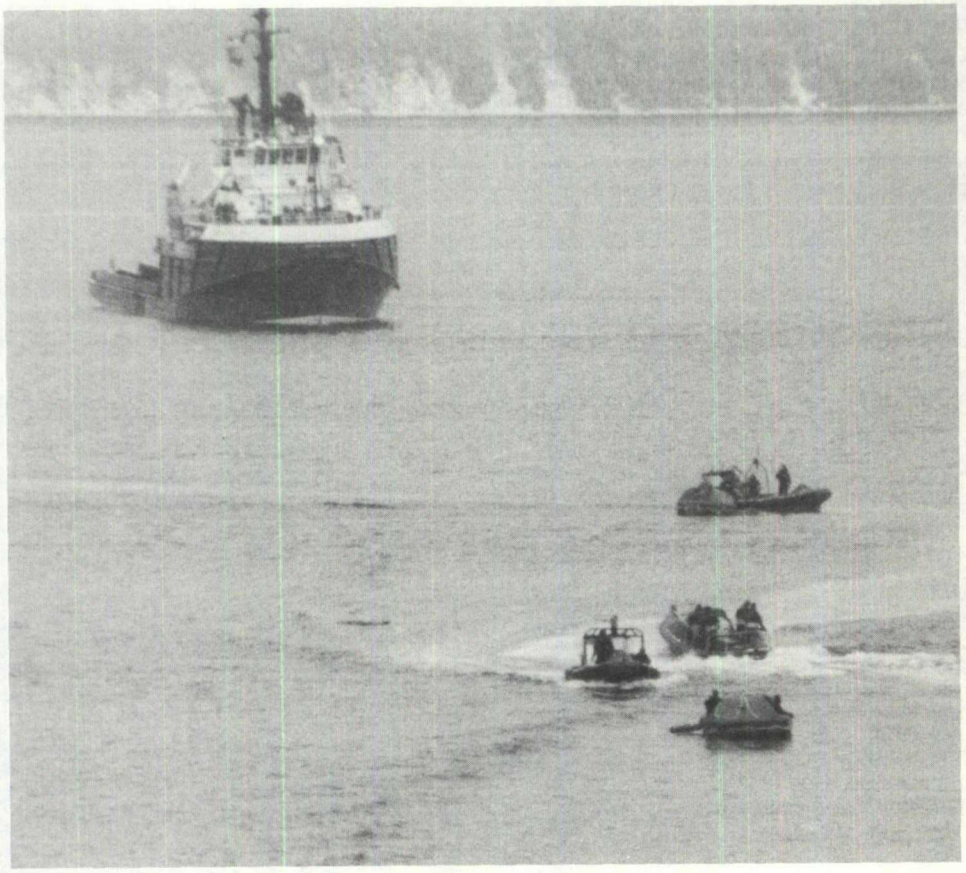
It was recommended in Report One that a full-time dedicated search and rescue helicopter be provided by either government or industry, fully equipped to federal SAR standards, and readily available with a trained crew able to perform all aspects of rescue. Since December 1983, industry has been required by COGLA to provide a full-time helicopter for rescue purposes. COGLA has not, however, issued specific guidelines regarding the level of service to be provided by this helicopter. The oil companies accordingly arranged with the helicopter contractors to have one helicopter on standby but only when helicopters are flying to and from the rigs. The helicopter is "designated" and not "dedicated". This fact allows the helicopter contractor to re-assign the standby helicopter to meet the requirements of the operator. Current industry practice allows the designated helicopter to be used for regular crew transport if another helicopter, capable of filling the standby role, is within sufficient flying time of the airport to allow it to respond to a rescue mission within 30 minutes. When there are no regular helicopter operations, a standby crew for the designated rescue helicopter is on a one-hour call out but they are not stationed at the airport. The standby crew does not include a rescue technician. The provision of a standby helicopter on a rotational basis by several helicopter contractors, only while helicopter operations are being conducted, does not constitute a full-time rescue capability for offshore drilling operations. The absence of rescue technicians also reduces the industry's capability to provide rescue services offshore. A better solution should be found.

Appendix F(2) Provisions for Common Response/Alert Plans, Flight Following and Ice Management. "Where more than one operator is active in a particular area, the adoption of common response/alert plans, flight-following, and ice management services are required. This program of joint emergency preparedness should be complemented by operator equipment resource-sharing arrangements."

Drilling for Oil and Gas on Canada Lands, Guidelines and Procedures. April 1984

A major improvement in the ability of industry to respond to emergencies has been the creation of a series of multilateral agreements between the several oil companies to provide for the integration of contingency planning and procedures for action and for the elimination of legalistic, contractual and other roadblocks that would impede joint action. The East Coast Operators Management Committee co-ordinates these objectives and through various committees there have evolved common response procedures for emergencies. It is evident that industry has exceeded regulatory requirements in this area of emergency response. It is unfortunate that there has not been closer collaboration with government in the development of these common policies and shared procedures to effect greater co-ordination with federal SAR. Steps should now be taken by both industry and government to test the effectiveness of the system and to train, through simulated exercises, key personnel in their essential roles in the event of a disaster. Recent exercises have identified potential and actual weaknesses in the system, particularly in its integration with federal SAR and in lines of communication, which need to be rectified. It is, however, imperative that these auspicious beginnings be pursued and that industry be encouraged to continue the development of common policies and procedures that will make joint emergency responses more efficient, minimize the possibilities for confusion, and facilitate the adoption and administration of optimum standard safety policies. In this way the oil industry will become an important integral component of a national SAR program and the safety of those engaged in offshore oil operations will be enhanced.

The final responsibility for rescue is that of the state; its obligations touch all the others and, in some particulars, transcend them. It retains that residuum of responsibility that it alone has the resources to exercise. The responsibility of the state for rescue is exercised in Canada by the federal government. Since 1947, a federal SAR capability related to air traffic was developed to meet Canada's obligations to the International Civil Aviation Organization. The initial responsibility was assigned to the Royal Canadian Air Force and continues to be a function of the Department



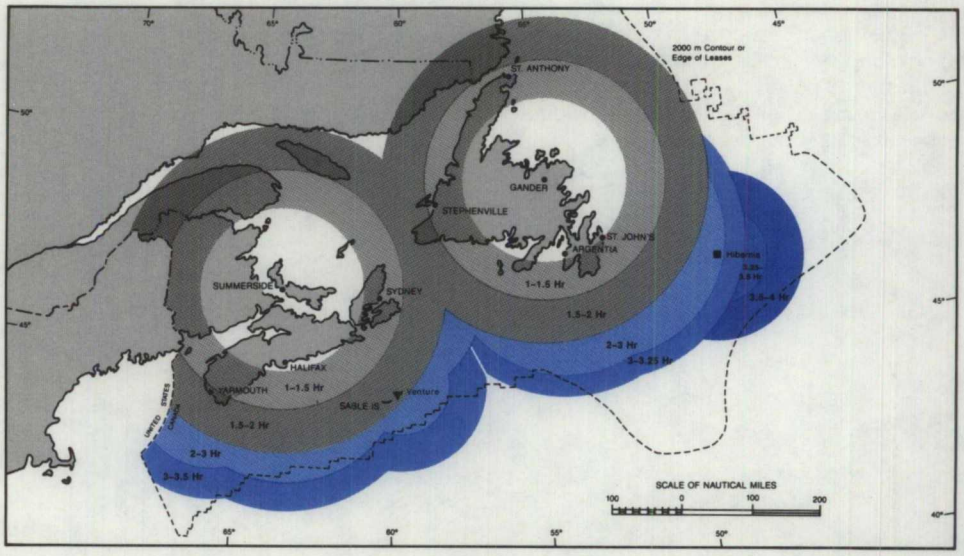
9.4 Emergency response exercises involving rigs, supply vessels, helicopters, fast rescue craft, and government SAR resources provide valuable training and identify weaknesses in emergency response plans.

of National Defence. Federal involvement with marine SAR has a longer history, deriving primarily from local needs for water rescue service, then growing to meet the demands of commerce and of international agreements, with services being provided by the Marine Administration of the Department of Transport. Federal SAR has been so organized that the Department of National Defence is responsible for co-ordinating all air and marine search activities in Canada and in adjacent areas for which Canada has accepted responsibility under international agreements and for providing dedicated air resources to respond to both air and marine distress incidents. Subsequently, the Minister of National Defence has become the lead minister and the government spokesman on SAR.

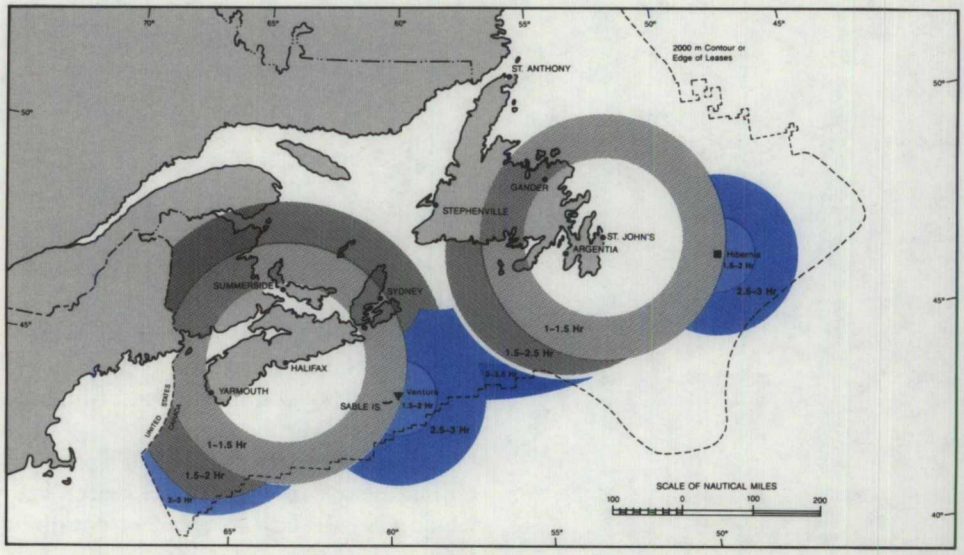
The prime objective of federal SAR is to aid persons involved in air and marine incidents within the area of Canadian responsibility. Since most SAR incidents, as presently defined, are generated by the inexperienced or the imprudent, federal SAR seeks, through governmental and other agencies, to foster the prevention of incidents through education and regulations. It also aims to relieve human suffering in emergencies through the provision of mercy flights and to aid civil authorities in the search for missing persons on land or at sea.

The federal SAR system is organized into four Search and Rescue Regions with a Rescue Co-ordination Centre (RCC) at Victoria, British Columbia; at Edmonton, Alberta; at Trenton, Ontario; and at Halifax, Nova Scotia. At present the federal government has dedicated 42 vessels and 24 aircraft to a primary SAR role. The vessels are owned and operated by the Canadian Coast Guard, while the Department of National Defence owns and operates all primary air resources. These resources are distributed amongst the four regions on the basis of a debatable interpretation of statistics of incidents and on the basis of estimates of clients to be served, which do not include, except in a passing fashion, persons involved in offshore

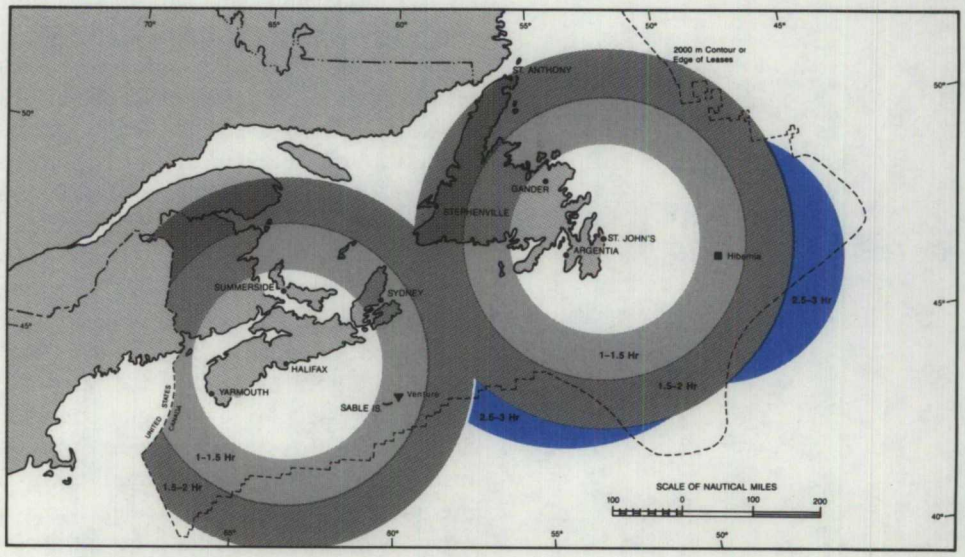
9.5 The SARCUP helicopter, an upgraded Labrador/Voyageur CH113, has an average still-air speed of 115 knots and an endurance time of 5 hours, 12 minutes to zero-fuel. The information in this and the following two illustrations assumes that a rig is present at Hibernia, and that there is a base at Sable Island, for refuelling. The outermost rings in these illustrations do not necessarily represent the maximum possible endurance of these helicopters, but are based on the Instrument Flight Rules requirement that each helicopter must file a flight plan designating a primary and an alternate landing location. Shading has been used to help differentiate between adjacent rings.



9.6 The Sikorsky S-61 helicopter has an average still-air speed of 115 knots and an endurance time of 5 hours to zero-fuel.



9.7 The Aerospatiale Super Puma helicopter has an average still-air speed of 135 knots and an endurance time of 5 hours, 30 minutes to zero-fuel.



oil exploration. In addition, National Defence and Coast Guard and other government departments have designated some of their resources as having a secondary SAR role.

The primary SAR air resources available to RCC Halifax at the time of the loss of the *Ocean Ranger* were three Labrador/Voyageur helicopters at Gander and three Labrador/Voyageur helicopters and three Buffalo aircraft at Summerside. There were Auroras at Greenwood, Nova Scotia, and also Sea King helicopters at Shearwater, Nova Scotia in a secondary SAR role. To provide air response 24 hours per day, 7 days per week and 365 days per year, and to maintain the capability of having one helicopter ready to take off with a high degree of reliability, a SAR helicopter unit, it is contended, must have a minimum of three helicopters and five crews.[4] The number of crews required to man three helicopters depends upon the length of the standby.[5]

The Labrador/Voyageurs are twin turbine, tandem-rotor amphibious helicopters with a normal cruising speed of 115 knots and an operating radius of approximately 225 nautical miles. They carry a full complement of rescue equipment and normally a crew of five, consisting of pilot, co-pilot, two search and rescue technicians (SARTECHs) and a flight engineer. These helicopters were manufactured some twenty years ago and have undergone extensive renovations under the search and rescue capability update program (SARCUP), which was launched in 1976 by the federal government. At the time of the loss of the *Ocean Ranger*, they were in the process of being rebuilt from the basic air frame and provided with upgraded equipment. The Labrador/Voyageurs are no longer being produced and spare parts are difficult to obtain. To maintain them to Department of National Defence standards requires, therefore, a rigorous maintenance program, involving long periods of time when a helicopter is not available for duty. The helicopters did not, in 1982, have radar, automatic flight-control systems, hover-coupler systems or VHF/FM marine band radios.[6]

The Buffalo fixed-wing aircraft is well suited for its search role with radar, Loran C and radio equipment; it can also drop SEA kits and life rafts to survivors at sea. The Aurora is capable of performing visual and electronic searches for extended periods and can be used as the "on-scene commander". It has forward-looking infrared sensors which can be used to locate persons in the water. It is also equipped to drop SEA kits and life rafts. It has, however, limited visual search capability because of a lack of spotter windows and its high speed. The Sea King helicopter has a range of only 170 nautical miles, but with much of the same equipment and with auto-hover capability it is better equipped to perform sea rescue than the Labrador/Voyageur.

Federal SAR helicopters can reach the Hibernia area and most drilling locations along the Scotian Shelf within two to three hours' flying time. Locations on the southern Scotian Shelf and on the Grand Banks east and south of Hibernia may take as long as four hours' flying time to reach. These times are in addition to the 30-minute and 2-hour standby times. The southern Grand Banks and the Flemish Cap are beyond the range of these helicopters, without refuelling en route.

The crews of the helicopters and fixed-wing aircraft used for search and rescue are highly trained. In addition to basic training, a pilot completes a 35-day specialist course and, after one to three years' experience as a SAR pilot, can be upgraded to

[4]This arrangement will make possible the provision of a response at 30 minutes' notice during working hours and at two hours' notice during off-duty when at least one crew will be on call at home.

[5]For a 30-minute standby, 8 hours per day every day of the year, 6 crews are required.

[6]Radar allows a pilot to fly below cloud cover at night because he can differentiate and locate high ground. An automatic flight-control system and hover-coupler system allows a helicopter to hover in a fixed position close to the water without pilot assistance. VHF/FM marine allows a pilot to communicate directly with vessels during a rescue attempt.

9.8 Helicopters under contract to the industry can be equipped with a hoist for recovering survivors from the water, but only government SAR helicopters currently carry a trained rescue technician who may be lowered to provide assistance.

Aircraft Commander. Continuing training and regular proficiency checks are required. SARTECHs will have completed a 35-day preselection course on survival and diving and a 120-day SARTECH course of training that includes survival techniques, medical treatment of survivors and hoisting from a helicopter, followed by a 21-month apprenticeship to a senior SARTECH. SARTECHs must also undertake continuation training and undergo regular proficiency checks.

The Canadian Coast Guard, as a part of the federal SAR program, had in the Halifax Search and Rescue Region, at the time of the loss of the *Ocean Ranger*, a number of small rescue boats which, based at various locations along the coasts, were used for rescues close to shore. There were also four ocean-going Coast Guard vessels, assigned to search and rescue duties, which patrolled the territorial waters off the East Coast of Canada. Of these, two – the *Grenfell* and the *Jackman* – are former offshore supply vessels, while the *Alert* was designed and built for search and rescue duties. The fourth, the *Daring*, is no longer in service. All three current vessels have twin screws and bow thrusters. The vessels are equipped with firefighting equipment, portable pumps, first aid equipment, diving equipment, line-throwing apparatus, scramble nets, and life rafts. The *Jackman* and the *Grenfell* are equipped with crane-launched rigid rescue boats and inflatable boats; the *Alert* has two inflatable rescue boats, but will not have a FRC until its 1985-86 refit. All three vessels have facilities for helicopter winching and the *Alert* has a helipad. The *Grenfell* is equipped with a rescue basket but the other vessels are not. The presence of bulwarks in the rescue zones of all three vessels makes it difficult for survivors to climb aboard directly from the water and for rescuers to render assistance. These vessels are not as fully equipped for rescue as the supply vessels used by industry. The officers of the Canadian Coast Guard SAR vessels are highly trained, but the majority of the seamen have not completed the BOT, BOST or any other basic course in marine training nor in rescue techniques as required in the North Sea. The men are trained on the job through drills and shipboard exercises.

Since the loss of the *Ocean Ranger*, the Canadian Coast Guard has added a new primary SAR vessel, the *Mary Hichens*, replacing the *Daring*, which will be used for SAR duties off the coast of Nova Scotia. The vessel, originally designed as a supply vessel, was converted by the Coast Guard for rescue operations. It is equipped with firefighting equipment, two fast rescue craft, two rescue baskets, and a medical

treatment area. The vessel's original design was altered to accommodate a helicopter landing zone and two rescue zones.

Since 1982, more of the Labrador/Voyageurs have been refurbished and re-equipped under SARCUP and provided with improved radio and navigation systems but they are still not suitably equipped for offshore SAR duties. They continue to lack an automatic flight control system, all-weather flying capability and doppler auto-hover equipment which is not currently available for this model. Another deficiency is the Labrador/Voyageur's relatively short range and its lack of endurance for marine rescues offshore. There are also weather limitations, because these helicopters are not permitted to fly when there is icing, present or forecast. The Labrador/Voyageurs are also limited for start up and shut down, by manufacturer's specifications, to steady winds of 52 knots. The presence or forecast of gusts will reduce that limitation to 30 knots when the gust spread reaches the allowable maximum of 15 knots. A hangar exists at Summerside, but not at Gander, in which a helicopter can start up should these wind conditions prevail.

The deployment of these federal resources is determined by many factors. Weather and operating limits are important considerations in the siting of aircraft as is the availability of support infrastructure for their maintenance and general servicing. The presence of alternate sources of rescue affects the location of marine resources. Prime factors apart from political intervention are the number of clients to be served and the need for these resources as perceived by those in authority.

The number of clients to be served will be influenced by the density of population and the concentration of activities. The potential marine client population is defined, in short, as all those who earn their living on the sea or use the water for recreation. The largest potential client population, for example, in the Victoria and Trenton regions, are the occupants of pleasure craft, while the largest potential group in the Halifax region, and the second largest nationally, is the fishing community. Basically, the potential marine client population is governed by the expressed purpose of federal SAR activities, which is stated to be:

> to prevent the loss of life and injury through search and rescue alerting, responding and aiding activities which use public and private resources; including where possible and directly related thereto, reasonable efforts to minimize damage to or loss of property, and by ensuring appropriate priority to aviation and marine safety measures focused on owners and operators most commonly involved in SAR incidents.[7]

The inclusion of protection of property in the stated SAR objective is of some consequence, because, in the planning, development and utilization of resources, it should be clearly understood that the overriding objective is to provide a lifesaving rather than a salvage service. Admittedly, there are instances where the two are inextricably interwoven; yet there are cases where they are not. There should be no doubt that government SAR is centred on the saving of lives.

It cannot be denied that accurate and continuing analysis of SAR incidents is essential for comprehensive planning, for properly assessing and determining operational requirements and for guidance in preventive action. An appropriate weighting system must, however, be devised, both for concentrations of SAR-related incidents and for concentrations of marine activities and clients, to assess the hazard to life associated with each accident. That weighting system does not yet exist. It is indeed apparent that the manner in which statistical data have been assembled, correlated and analysed contributes to invalid conclusions and does not provide a rational or

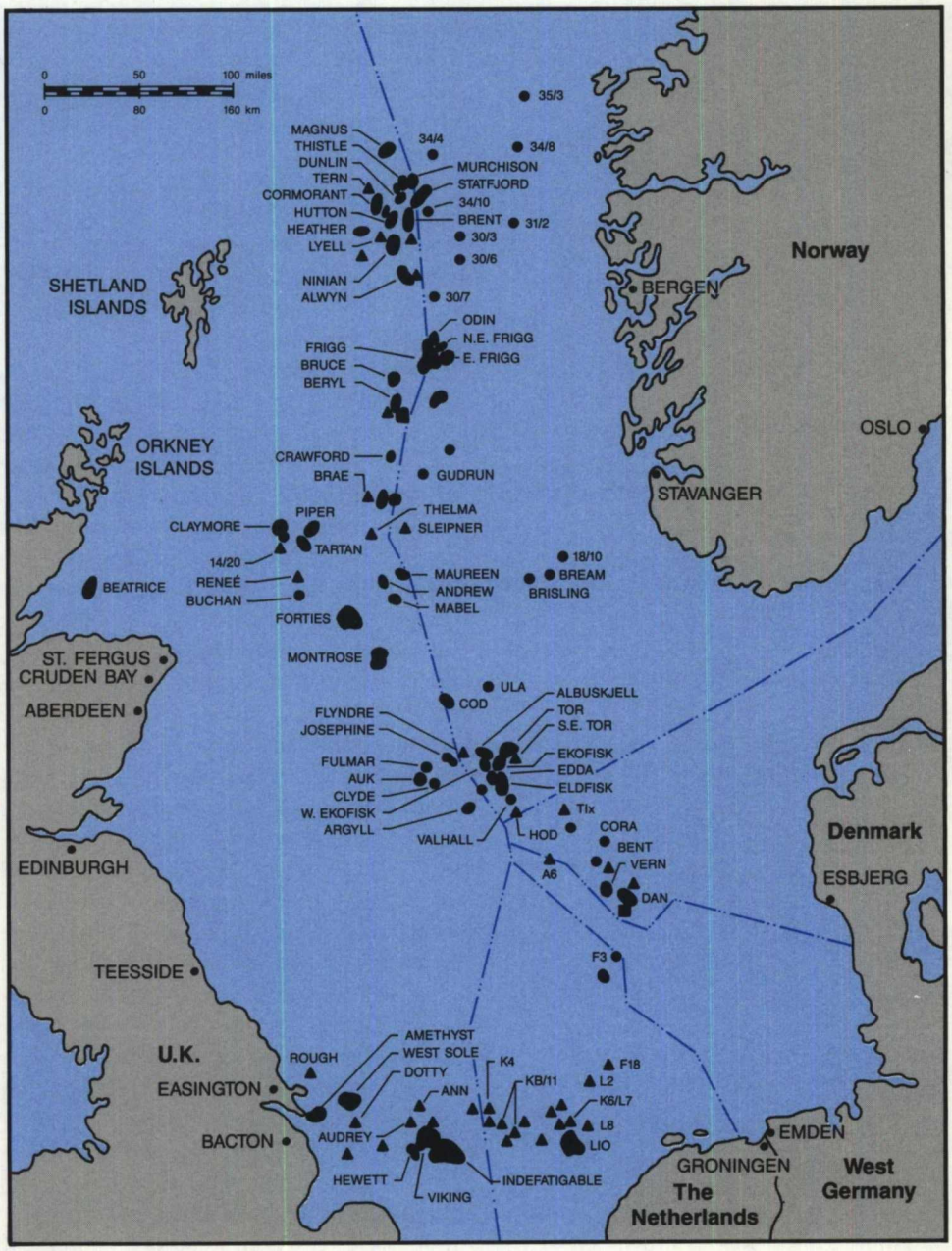
[7]Cabinet Committee on Foreign and Defence Policy, 1982. *Report on an Evaluation of Search and Rescue*, "the Cross Report".

trustworthy basis for decisions regarding the deployment of limited resources. It is largely because of weaknesses in the statistical basis of decisions that serious criticism of the criteria for deployment of SAR resources has arisen.

It is of interest and possibly of enlightenment to compare Canadian SAR with what has evolved in the North Sea countries. There are, of course, vast differences in demography and geography to take into account, in the manifold traditions and in the scale of activities both in the near and the far offshore. Nevertheless a comparison can be instructive in illustrating how these countries have organized resources for emergency response. The oil and gas fields in the North Sea are now in the production phase and contain some 140 installations and approximately 15,000 people. The fields are generally within 1½ hours' helicopter flying time of five countries which border the North Sea. These countries have developed co-operative plans of mutual aid in the event of marine disaster. During the early years of development in the North Sea, industry tended to look to governments for SAR services to the far offshore. But it was generally recognized, as the industry developed, that the oil companies, with vessels and helicopters under contract, should provide response in the first instance and that the government SAR would supplement their efforts and responsibilities during the exploration phase. The oil companies have, over time, improved their self-help capabilities, organized sector clubs, and negotiated arrangements among themselves for mutual assistance and mutual sharing of resources in an emergency. They are now in the production phase and industry helicopters with SAR capability and trained crews are stationed on selected fixed production platforms.

The complicated organization and system of delivery of government SAR services are, particularly in the United Kingdom, the result of traditions, of density of population and of the magnitude of activities in the near offshore. Traditionally, volunteers through the Royal National Lifeboat Institution play a major role. In the United Kingdom overall Ministerial responsibility for policy on civil marine and aviation safety, including search and rescue, lies with the Secretary of State for Transport. Its marine SAR responsibilities are co-ordinated by its Marine Directorate and Her Majesty's (HM) Coastguard. HM Coastguard has no dedicated SAR vessels, as the Canadian Coast Guard has, but utilizes the resources of other agencies. It co-ordinates marine rescue activities through six Marine Rescue Co-ordination Centres. The Ministry of Defence, by an interdepartmental agreement has held, since 1947, the responsibility for all civil aeronautical incidents. Accordingly, the Royal Air Force maintains two RCCs and 18 dedicated helicopters on continuous standby, 2 per squadron, ready to fly at 15 minutes' notice by day and 45 to 60 minutes by night (compared with Canadian standby times of 30 minutes by day and 2 hours by night). These Sea King and Wessex helicopters can be tasked, when needed, by HM Coastguard, but throughout the rescue operation they remain under the control of the appropriate RCC. The Royal Navy maintains dedicated Wessex helicopters which can be tasked by HM Coastguard. There is also a Nimrod, the counterpart of the Aurora, at one-hour standby by day or night and a second Nimrod is at six hours' readiness. Where the U.K. Department of Transport uses resources of the Ministry of Defence, it pays for them and where it needs SAR air resources in areas that have no military requirements, as off the Shetlands, it charters commercial helicopters. On the Shetlands a commercial dedicated helicopter, fully equipped with winch, auto-hover, direction-finding, flight-tracking and infra-red sensors and radar equipment and fully manned with a trained crew is on 15-minute standby by day and 45-minute standby by night.

In Norway, SAR responsibility rests with the Ministry of Justice and Police which has two RCCs, manned by personnel from military and communication agencies in spacious, well-equipped control centres and controlled by the Police. Dedicated Sea King helicopters, bought by the Ministry of Justice and Police and operated by the Air Force, are on 15-minute standby by day and 1-hour by night. These heli-



9.9 The North Sea is divided into five search and rescue zones administered by the United Kingdom, Norway, Denmark, West Germany and the Netherlands. Industry resources also play a significant role in North Sea search and rescue.

copters, two per squadron, are fully equipped and are each manned by a trained military crew of five. Marine SAR services on the other hand are provided by a volunteer organization, the Norwegian Society for Sea Rescue, which is supported 60 percent by government and 40 percent through charitable donations. Coast Guard and naval vessels can be tasked for SAR duties.

The Canadian federal SAR system, a product of the post-war period, has had to contend with extremes of weather, with vast unpopulated areas, with large ocean expanses, with sparseness of coastal population and with a relatively low concentration of activity offshore. The total available resource for primary SAR roles is not overly impressive nor does superior technical efficiency compensate for its paucity. Indeed, with few exceptions, neither the vessels nor the aircraft designated for primary SAR roles were designed for that specific purpose. Rather they were intended to serve the more normal operational requirements of the Department of National

Defence or of the Coast Guard. Levels of service have not been established nor have criteria been determined as a basis for evaluating the quality of service rendered. What, in fact, has been delivered is a set of discrete SAR activities or services provided by the two departments directly involved rather than an integrated program developed to provide adequate and timely response in the event of a disaster.

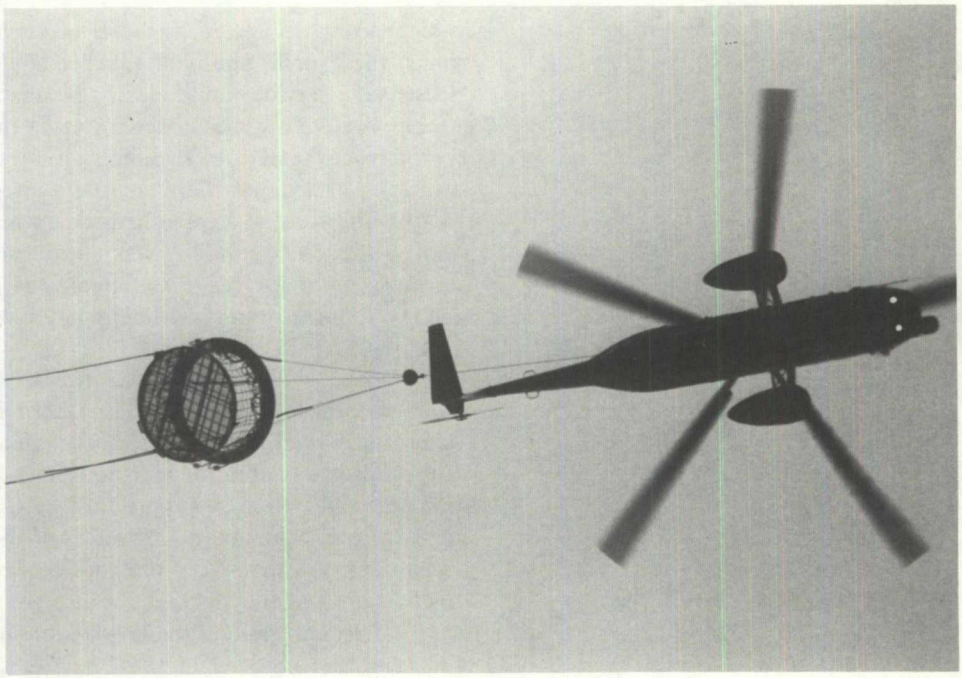
Much has, indeed, been accomplished in the promotion of public safety awareness, in the encouragement of volunteer associations, in technological improvements in equipment and rescue apparatus and in respect of co-ordinated approaches to an integrated SAR program. The stubborn fact remains, however, that no single agency for developing, implementing and controlling a national SAR program is yet in place. There is no single functioning agency with the mandate to knit together the several components into a comprehensive SAR program. The federal government has been aware of this need and, in 1976, established the Interdepartmental Committee on Search and Rescue (ICSAR) to facilitate co-ordination and to provide advice to a Cabinet Committee on SAR policy, planning and resources. A major study conducted during 1980-82, *Report on an Evaluation of Search and Rescue*, to evaluate SAR recommended *inter alia* the establishment of a national SAR program that would encompass the efforts of government, industry and volunteer associations towards an integrated approach to SAR problems. That report was specific regarding how an integration of all resources for clearly defined SAR roles would promote a framework for improved planning, for more objective choices of goals and for better selection of equipment. It was also specific regarding how a national SAR program would achieve a greater use of existing non-SAR resources and how greater participation by the private sector could be encouraged and the prevention of incidents enhanced through educational and regulatory measures to increase public awareness of safety. Notwithstanding acceptance of the report by the federal government and endorsement by the Cabinet of the concept of a national SAR program, appropriate measures to put it into effect have not yet been initiated.

"In Canada, the SAR Program is a collection of activities performed by several departments, developed historically from individual air and marine requirements. . . .In many other countries (e.g. U.S.A., U.K., Australia) the National SAR Plan is limited to a definition of the SAR responsibilities of various national, provincial and local authorities and such responsibilities are clearly set out in a national SAR Manual. Thus while Canada has gone further than other countries in co-ordinating federal government efforts and resourcing through its national SAR Plan, the plan does not describe the role of other authorities, nor indicate the resources available to them for SAR."

Report on an Evaluation of Search and Rescue. Cabinet Committee on Foreign and Defence Policy, September 1982

What is now required is a distinct integrated structure, under a lead minister who is not otherwise directly involved in the delivery of SAR services and who is consequently not involved in any conflict of interest, potential or actual, in setting priorities for government policies and spending. Managers are required for the national SAR program, who have no inherent conflict of interest between their departmental obligations and their responsibilities for any SAR-related activities. A discrete program identity with a discrete budget is needed for establishing both policies and related expenditure levels in order to permit evaluation of SAR as a distinct element of the appropriate financial envelope by the Cabinet subcommittee responsible for that policy. In this way SAR requirements would, for the first time in Canada, be assessed in their own right and in the context of SAR policies alone. For the first time SAR vessels, helicopters, equipment, and facilities would be assessed primarily in terms of their suitability for SAR functions and not as resources designed and acquired for other purposes and adaptable to SAR purposes, if nothing better became available. With a distinct administrative structure and a distinct and separate funding mechanism in place, it would then be possible to identify objectives and range of services, to develop scales of self-help, to define levels of service and to create a comprehensive data base with storage, analytical and retrieval capabilities to meet policy and operational needs; in short, to create a national SAR program.

The question, basic to this report is what, within the framework of an integrated national SAR program, is to be the role of the operating oil companies and of federal SAR in enhancing the opportunities for the rescue of those involved in offshore drilling operations. An analysis of the British and Norwegian systems reveals features that might help to provide an answer. The first line of response must, because of the distance of operations from shore and the resources immediately available, rest of necessity with industry. The capability, therefore, of the standby vessels, the



9.10 Industry resources provide the first line search and rescue response for the East Coast offshore.

level of training of their crews, the practical quality of rescue equipment on board must be of the highest possible order and acceptable to the regulatory agency. Accurate and timely information is essential for prompt operational response to SAR requirements. This need imposes a heavy responsibility on those who have the obligation as well as the means, to provide the information. That means should encompass the emergency position indicating radio beacon (EPIRB), the emergency locator transmitter (ELT) and the personal location beacon (PLB). The timeliness of an operational response in cases of distress in the North Atlantic is obviously of critical importance. To this end, effective contingency plans need to be co-ordinated amongst the operating oil companies and drilling contractors and government SAR. Exercises based on these plans to cope with simulated disasters are also crucial to the training of key personnel, to the testing of communications and to the evaluation of joint plans themselves. The response to an offshore disaster will involve all available helicopters for rescue purposes. The industry should therefore continue with its efforts in providing all helicopter crews, pilots and hoist operators, with basic rescue training.

Before the loss of the *Ocean Ranger*, government SAR resources had been developed and deployed primarily to help those in need of their services whether on land or near the coast. There existed no plan for a major disaster far offshore; help would simply be provided to the extent that it was feasible. The present deployment of federal air resources in the Halifax Search and Rescue Region is consequently inadequate to serve the offshore oil and gas industry. The present location of helicopters and fixed-wing aircraft may indeed reflect the optimum deployment in respect of covering the majority of marine distress incidents as determined on the basis of questionable historical data. The Grand Banks and the Scotian Shelf are areas that in fact have had the smallest concentration of incidents. The more serious risks and the largest concentration of dangerous activities will, in future, arise in the offshore oil and gas fields and intervening areas and may affect rigs, service vessels or helicopters. The loss of the *Ocean Ranger*, the supply vessel, *Seaforth Jarl*, the seismic vessel, *Arctic Explorer*, and the ditching of a helicopter on the Scotian Shelf give ample evidence of the need for more attention to the risks involved offshore.

The relocation of SAR resources to St. John's and Halifax would provide optimum coverage for the oil and gas industry. On the other hand, it would represent

a significant decline in the level of service along Newfoundland's West Coast and along the North Shore of Quebec and the Gulf of St. Lawrence. Since such a decrease in service would clearly be unacceptable to the public, alternative solutions to the problem must be sought. During the winter of 1984-85, a helicopter was transferred from Gander to St. John's on a routine basis and a second fixed-wing Tracker aircraft was located there for the winter months. The Commander of the Halifax Search and Rescue Region had the authority to use the helicopter as operational circumstances dictated. That was an interim expedient measure. The Tracker aircraft, normally used for fisheries patrol, has a range of 1,000 nautical miles, mediocre radar equipment but is without spotter windows and the capability of dropping SEA kits.

What, in short, is needed is a SAR service to the offshore oil industry that is supplemental to those offered to other clients and that will not detract from the predetermined level of service to those clients. It was stated earlier that the Labrador/Voyageur is unsuited for marine rescue duties offshore. These helicopters completed their capability update program (SARCUP) in June 1984 but they continue to lack many of the technological advances of the past two decades. They lack the auto-hover capability which every offshore SAR helicopter should have, their range is relatively short and they lack endurance for marine rescue offshore. What is now necessary is that government make available by acquisition or by chartering, as is done by the United Kingdom in the Shetlands, long-range helicopters instrumented and equipped with the most recent technology, each manned to federal SAR standards to carry out all aspects of search and rescue, for the Grand Banks, for the Scotian Shelf and for the Labrador Sea while drilling is taking place. These helicopters, at least one for each area, should be on 15-minute standby by day and not more than 45 minutes by night.

Whatever SAR system evolves, there remain the inescapable facts that there are physical limits beyond which the response time cannot be reduced and that it is of critical importance to extend survival time to the absolute limits that science and technology will permit. Administrative structures, policies, regulations and standards must be improved in combination with research into and with development of survival equipment, rescue resources and delivery systems so that, even in the hostile environment of the Northwest Atlantic in winter, the wait for rescue may not be a hopeless prelude to death.