Workshop on

MARITIME EMERGENCY MANAGEMENT
IN THE CASPIAN SEA:
COOPERATION IN SEARCH AND RESCUE

Astrakhan, Russia

22-25 August, 2005

PROCEEDINGS

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of a Workshop on

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Maritime Emergency Management in the Caspian Sea:
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Astrakhan, Russia, 22-25 August, 2005
David N. Griffiths (ed.)

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Editorial Introduction

The Workshop on *Maritime Emergency Management in the Caspian Sea: Cooperation in Search and Rescue* was an informal exploratory discussion in which technical experts from the coastal states of the Caspian Sea were invited to participate as professional individuals rather than official representatives of their organizations. The aim was to conduct a candid, creative and innovative exchange of ideas about improving cooperative emergency management arrangements in the Caspian region, especially in maritime Search and Rescue. The informal and non-official nature of this event would have made the publishing of formal concluding resolutions inappropriate. Consequently, these *Proceedings* are not a complete record of everything that was said but are, rather, a summary of the scope, tone and spirit of the discussion. The conclusions recorded are the facilitators' perception of the consensus among participants and are not binding on any of the participants or their organization. Any errors, omissions or misinterpretations are the responsibility of the facilitation team alone.

Acronyms and Abbreviations

Note: The acronyms and abbreviations below are those used during the workshop and in this document. A complete list of Search and Rescue abbreviations and acronyms, and a glossary, are available in the International Aeronautical and Maritime SAR (IAMSAR) Manual.

ASTU	Astrakhan State Technical University
CFPS	Centre for Foreign Policy Studies
CMC	Cooperative Monitoring Center
FIR	Flight Identification Region
GMDSS	Global Maritime Distress and Safety System
IAMSAR	International Aeronautical and Maritime SAR Manual
ICAO	International Civil Aviation Organization
ICS	Incident Command System
IMO	International Maritime Organization
IOI	International Ocean Institute
ISO	International Standards Organization
MARPOL	International Convention for the Prevention of Pollution from Ships
MI	Marine Institute of Memorial University of Newfoundland
MOU	Memorandum of Understanding
MRCC	Maritime Rescue Coordination Centre
NCP	National Contingency Plan
NSP	National SAR Plan
NSS	National/Regional SAR Supplement (to the IAMSAR Manual)
OPRC	International Convention on Oil Pollution Preparedness, Response and Cooperation
OSC	On-Scene Coordinator
RCC	Rescue Coordination Center
RSC	Rescue Sub-Centre
SAR	Search and Rescue
SC	SAR Coordinator
SMC	SAR Mission Coordinator
SOLAS	International Convention for the Safety of Life at Sea
SRR	Search and Rescue Region

Welcoming Remarks

The workshop began with a formal opening session at which the following dignitaries welcomed the participants, noted the importance of the topics under discussion, and expressed best wishes for a successful event.

Professor Yuri Pimenov
      Rector, Astrakhan State Technical University

Mr. Zhenis Kalibekov
      Vice-Consul of the Republic of Kazakhstan in Astrakhan

Dr. David Betsill
      Cooperative Monitoring Center, Albuquerque NM, USA

Professor Viacheslav F. Zaitsev
      Director, International Ocean Institute Operational Center, Caspian Sea

Introduction to the Workshop

In May 2004, at a workshop on *The Caucasus, Caspian and Central Asia: Maritime Dimensions of Security* held at Dalhousie University in Canada, several participants from Caspian countries commented on the limited cooperation in maritime aspects of emergency management in the region. Informal discussion among several participants from both the Caspian region and from Canada and the United States, resulted in a commitment to explore the options for helping to improve that situation. During the year that followed, several independent activities by different organizations were to converge into a common interest in improving cooperative emergency management in the Caspian.

The Halifax workshop had been conducted by Dalhousie University's Centre for Foreign Policy Studies (CFPS) in partnership with the Cooperative Monitoring Center (CMC) of Sandia National Laboratories in Albuquerque, New Mexico. CMC had been supporting other projects at Dalhousie and has an ongoing Caspian and Central Asia program of its own. Both institutions therefore agreed to pursue the idea of assisting the establishment of a maritime emergency management initiative for the Caspian.

CFPS also had links with the International Ocean Institute (IOI), for which the Caspian Sea is a priority area. IOI has two Operational Centres in the region: one in Astrakhan, Russia, and another in Tehran, Iran. In 2003, the Astrakhan centre had hosted a *Leadership Seminar on the Caspian Sea and its Deltas Region: Sustainable Development and Regional Security* at which many of the conclusions had highlighted the importance of improved maritime cooperation in the Caspian. Meanwhile, two Canadian specialists in emergency management and international relations had been developing an international seminar on *Fundamentals of Cooperative Emergency Management* which, in July 2004, was included into the IOI training program on *Ocean Governance: Policy Law and Management*, held annually in Dalhousie University at its campus in Halifax, Nova Scotia. At about the same time, the newly established International Centre for Emergency Management Studies (ICEMS) at Cape Breton University offered to host the IOI seminar at its campus in Sydney, Nova Scotia. Not only were both facilitators Research Fellows at the new Centre, but also the University has particular expertise in maritime issues, especially through the oil and gas sector and its close partnership with the nearby Canadian Coast Guard College. This forged yet another link in the growing alliance of maritime-oriented institutions interested in addressing the Caspian emergency management issue.

By chance, the IOI summer training program brought together several people with an interest in the issue. Informally they concluded that it might be possible and appropriate to hold a workshop on maritime emergency management at the IOI Centre in Astrakhan as early as the autumn of the following year. In October 2004, a roundtable discussion on *Maritime Safety in the Caspian* Sea at the International Institute of Caspian Studies in Tehran, Iran, provided another opportunity to explore the issues more deeply. That discussion suggested that a useful model to consider for Caspian cooperation might be the *Maritime Safety Colloquium* which has, since 1997, been bringing together maritime safety specialists from across the Middle East and North Africa to discuss professional maritime safety issues in a non-political setting.

Throughout all of the discussions during 2004, it had become increasingly evident that the best prospects for success lay not in organizing a major conference to attempt to deal with the entire range of regional emergency management issues at once, but rather by beginning with a modest event that would focus on a vital sub-set of maritime emergency management - Marine Search and Rescue (SAR), building on the Middle East and North Africa experience as a potential model. Consequently, this workshop was organized as a four-day event in Astrakhan, hosted by the IOI's Caspian Sea Operational Centre and organized by a partnership between the International Centre for Emergency Management Studies in Sydney, the IOI in both Astrakhan and its Malta Headquarters, the Cooperative Monitoring Center in Albuquerque, and the Centre for Foreign Policy Studies in Halifax. Two experienced SAR facilitators from the Middle East colloquium agreed to provide the technical facilitation. Captain Anthony Patterson is a Master Mariner and Director of the Centre for Marine Simulation at Memorial University of Newfoundland, and Mr David Edwards is an experienced mariner employed with the Office of Search and Rescue at US Coast Guard Headquarters in Washington. The organizers were able to offer sponsorship to participants from three disciplines in each Caspian country (marine SAR, marine environmental response, and disaster management), and registration-paying guests were also invited from both government and industry.

The aim of the workshop was to bring together specialists responsible for providing maritime safety and related services from each of the five Caspian countries for three purposes:
- conduct analysis of marine hazards and marine emergency management arrangements for the Caspian Sea.
- identify gaps between required and existing cooperative arrangements for mitigation, preparedness, response and recovery from maritime accidents or disasters.
- propose steps for closing those gaps and enhancing mutual cooperation in maritime safety.

The workshop was structured as a technically focused, results-oriented meeting to provide experts from all five Caspian countries with an opportunity to identify their mutual maritime safety challenges, and to identify organizational and technical means by which these challenges might be addressed cooperatively. To that end, participants were invited to engage in this mutual problem-solving exercise as professional individuals rather than as representatives of their respective organizations, so that the exchange of ideas could be candid, creative and innovative.

1. Common Language

David Edwards opened the workshop by leading a discussion about language in international Search and Rescue (SAR) to ensure a common understanding among all participants. The focus of discussion was on the international accepted terms for SAR, but the session also compared and contrasted them with those used in other aspects of emergency management.

Common Language, Common Need
Cooperative action requires an ability to communicate quickly, clearly and accurately. Search and Rescue (SAR) therefore has its own unique terminology, as do other disciplines such as Disaster Management and Environmental Response. The international standard terminology for SAR had its origins in the English language which is the common standard for international air traffic control as well as SAR. Nonetheless, it is unrealistic to expect English to be used routinely in many bi-national or multi-national settings. In places like the Caspian region, for example, it is recognized that use of English may be limited or non-existent. In such cases, however, it is important to ensure that translations conform to the intent of the international standard.

International Standards and Practices
Terminology is not developed arbitrarily or unilaterally, but is the subject of international agreement and is promulgated in such documents as the *International Convention on Maritime Search and Rescue* and the *Convention on International Civil Aviation* (Annex 12). The technical "language" of SAR is published in the *International Aeronautical and Maritime SAR* (IAMSAR) *Manual*, extracts of which were provided to participants.

Search and Rescue (SAR) Organization

There are four levels of SAR management defined in the IAMSAR Manual and recognized internationally. Note the use of the term "coordinator" rather than "commander" to reflect the multi-disciplinary, multi-agency, and sometimes multi-national nature of SAR management.

- The *SAR Coordinator (SC)* is the upper level of national of management which identifies SAR resources, implements SAR plans, establishes Rescue Coordination Centres (RCCs) and assigns the duties of SAR Mission Coordinator (SMC) to specific cases.
- The *SAR Mission Coordinator (SMC)* is responsible for the mission planning and direction for a specific SAR case. He or she conducts the "detective work" of obtaining and analyzing as much information as possible about the nature of the unit in distress, its last known position and intended movements, the weather conditions, and other such essential data. The SMC does the search planning calculations, coordinates resources, keeps the SC briefed, and designates who will be the On-Scene Coordinator (OSC).
- The *On-Scene Coordinator (OSC)* is in charge at the scene. He or she evaluates and implements the SMC's plan, modifying it as necessary. Communications is a key element of the OSC's responsibility, both to coordinate the operation and to keep higher authority informed through the SMC.

- **SAR Facilities** are the units participating in a mission. They include both specially trained and equipped SAR units, and any other mobile resources capable of conducting SAR operations. These include such units and organizations as merchant ships, commercial aircraft, fishing vessels, volunteer organizations and commercial companies. Note that some SAR facilities can only conduct searches, while others are capable of being both searchers and rescuers.

Search and Rescue Regions

There is an internationally recognized network of **Search and Rescue Regions (SRRs)**, which are areas of responsibility for coordinating SAR operations. Each SRR is associated with a **Rescue Coordination Center (RCC)**. Although there are no marine SRRs defined for the Caspian Sea, there are existing aviation SRRs established under Annex 12 to the *Convention on International Civil Aviation*. That Convention requires that Contracting States shall:

"delineate the search and rescue regions within which they will provide search and rescue services. Such regions shall not overlap and neighbouring regions shall be contiguous."

Note 1 to the same document defines the purpose and principles as follows.

"Search and rescue regions are established to ensure the provision of adequate communication infrastructure, efficient distress alert routing and proper operational coordination to effectively support search and rescue services. Neighbouring States may cooperate to establish search and rescue services within a single SAR region."

Note: SRRs and International Boundaries

It is important to note that SRRs are delimited on the basis of practical and technical considerations that are not related in any way to national boundaries or boundary claims. This is clearly stated in the Maritime SAR Convention which says: "The delimitation of search and rescue regions is not related to and shall not prejudice the delimitation of any boundary between States." Similarly, the Civil Aviation Convention Annex 12, Note 2 states: "The delineation of search and rescue regions is determined on the basis of technical and operational considerations and is not related to the delineation of boundaries between States."

Disaster Management Organizational Terms

Unlike SAR, there is no internationally recognized standard way of organizing for Disaster Management, although there is a degree of consensus about the terminology for describing some of the concepts (discussed later in section 5). One approach is the **Incident Command System (ICS)** which is favoured in the United States. Although ICS is not an internationally adopted system (for example, Canada follows a different approach called the *Emergency Site Management System*) the ICS is widely used in military and police organizations and should, therefore, be understood by those working in an international setting. The ICS system is flexible so that it can be expanded, reduced or changed rapidly to meet the requirement of each circumstance. When an incident occurs, the person most qualified to take charge is designated the **Incident Commander (IC)** and establishes a headquarters at an **Incident**

Command Post (ICP). The most appropriate people and resources are then organized into *Sections* . These normally include an Operations Section, a Planning Section, a Logistics Section, and a Finance and Administration Section. Note that Search and Rescue can be incorporated easily into the ICS model for a major incident or disaster, typically in the Operations Section..

Environmental Response Terms

Although there is no international standard for environmental response organization, there are internationally accepted terms and concepts specific to environmental disasters. The primary reference documents for marine pollution are the *International Convention for the Prevention of Pollution from Ships* (MARPOL) and the *International Convention on Oil Pollution Preparedness, Response and Cooperation* (OPRC), both published by the International Maritime Organization (IMO).   The International Standards Organization has also established *ISO 14000*, which sets international standards for environmental management that reflects a global consensus on good environmental practice in the international context, but can be adapted to fit specific situations. Common terms and concepts generally accepted in the marine environmental protection field include the following.

- *Polluter Pays* is a common principle in environmental law, recognizing the responsibility of the polluter for the costs of response and recovery. This principle is incorporated into the 2003 *Framework Convention for the Protection of the Marine Environment of the Caspian Sea*. Note that this is different from the principles of SAR, in which saving lives is usually considered a humanitarian obligation rather than a recoverable cost.
- *Responsible Party* is the term used for whoever has discharged, or is in any way responsible for the discharge of a pollutant or hazardous substance.
- *On Scene Coordinator (OSC)* means the same as it does in SAR.
- *National Contingency Plan (NCP)* is a term commonly used to describe the environmental response plan of an individual State.

Conclusions - Management Concepts for Response

The Search and Rescue system has an internationally accepted vocabulary of common terminology, but disaster response organizations (including environmental response) do not. Nonetheless, there are commonalities and similarities which should be understood by those creating national, multinational or regional emergency management arrangements. Whatever organization is put in place, whatever common language or languages are used, whatever terms are adopted for use within the region, it is essential that a common lexicon and procedures be implemented and practiced. In the Caspian region, as in any other part of the world, effective and efficient marine safety or disaster management cannot be achieved unless there is an ability to communicate quickly, clearly and efficiently.

2. Critical Elements of Search and Rescue

Anthony Patterson led the second session in a discussion of the critical elements of a Search and Rescue (SAR) system. He began by discussing the incentives for providing a SAR service and then invited the participants to divide into two "breakout" groups to identify independently what they thought would be the critical elements of a good SAR system. Each group was provided with a list of ten suggested elements to discuss, to modify if appropriate, and then to rank in order of importance. The list (in no particular order) was as follows.

Some Critical Elements of an Effective SAR System

A. Qualified watchstanders and responders
B. Communications capabilities (among rescue assets and between rescuers and those in distress)
C. Dedicated response capabilities (boats, ships, aircraft)
D. Legislation/Budget to support SAR Organization
E. Cooperation: interagency and industry partners
F. Regional SAR coordination and cooperation
G. Established SAR policies and procedures
H. Preventative SAR (established educational efforts and safety regulations)
I. Training and exercising of contingency SAR plans
J. Readiness posture of response facilities/crews

When the two groups returned to compare results, it was striking that both had concluded that establishing legislation, organization and administration were their highest priorities. In the discussion that followed, the importance of both self-help and cooperative arrangements was identified, as was the critical role of communications in decision-making and situational awareness. Above all, however, the discussion demonstrated the need to establish an organizational and administrative framework - whether formally or informally - as the most important initial step in creating a regional SAR arrangement in such areas as the Caspian.

Captain Patterson concluded the session with a description and demonstration of the *Global Maritime Distress and Safety System (GMDSS)*, emphasizing how it now forms the backbone of modern SAR communications and is, therefore, a critical element that should be considered by Caspian SAR authorities when considering cooperation in the region.

3. The International SAR System

The third session, facilitated by David Edwards, considered the international conventions that govern Search and Rescue (SAR), discussed how SAR Regions (SRR) are defined and why they are established, examined the Global SAR Plan, and considered how international conventions are adopted into domestic legislation.

In a breakout session, the participant listed factors that should be considered when establishing an SRR. They were also provided with an extract of the *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual* containing sample legislation. A large map of the Caspian was used to discuss the existing *International Civil Aviation Organization (ICAO) Flight Identification Regions (FIR) and SAR Regions* for the Caspian, and the applicability of these existing aeronautical regions to maritime SAR These factors were then discussed in plenary. Throughout the session, it was emphasized that there is an international <u>obligation</u> for states to provide <u>effective</u> SAR services. In a region like the Caspian Sea, this in turn, requires cooperation between neighbours.

Duty to Assist
It is an accepted international principle that vessels and aircraft have a <u>duty</u> to provide assistance to other vessels, aircraft or persons in distress, without regard to location, nationality or circumstances. For example, Regulation V/10 (a) of the *International Convention for the Safety Of Life At Sea* (SOLAS) states:

> "The master of a ship at sea … on receiving a signal from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance, if possible informing them or the search and rescue service that the ship is doing so."

Because this duty or obligation to assist exists, governments and their maritime safety professionals have an obligation to address how to do it effectively.

International Agencies
There are two major international SAR agencies that provide guidance in establishing any national or regional SAR system: the International Maritime Organization (IMO), and the International Civil Aviation Organization (ICAO). Both are United Nations agencies that focus on safety. Both publish global SAR plans, procedures, techniques and training for civil SAR. Both aim for a global network of Search and Rescue Regions (SRRs), each managed by its own Rescue Coordination Centre (RCC), that will ensure coordinated and effective SAR anywhere on the globe where lives and property are at risk.

The Global Search and Rescue (SAR) System

International Conventions.
The global SAR system is established under three international conventions: the *International Convention on Maritime SAR*, the *Convention on International Civil Aviation, Annex 12*, and the *International Convention for the Safety Of Life At Sea* (SOLAS). These are implemented using the standards and guidance of the *International Aeronautical and*

Maritime SAR (IAMSAR) Manual and its *National/Regional SAR Supplements (NSS)*.

National Responsibilities

Individual governments are responsible for producing their own *National SAR Plan* (NSP). Not only is this the primary framework for the country's own SAR system, but also it is the State's contribution to the international framework upon which the global system is built. The usual practice is for the NSP to include provisions for establishing a National SAR Committee that includes representatives of all level of participation, from national government departments to local volunteer agencies. Such a committee is a proven means of developing national will and consensus for an effective SAR system. The IAMSAR Manual contains several useful tools for establishing a national system, including sample legislation for establishing a SAR organization, a National Self-Assessment on SAR, and sample Terms of Reference for a SAR Committee. Copies were provided to all participants of the workshop.

Regional Systems

The IAMSAR Manual notes that SAR systems can be established on a national basis, a regional basis, or both. A regional approach can reduce cost and improve the ability to deliver SAR services. Such an option would be particularly relevant to the Caspian Sea.

Advantages of Regional SAR Systems
(Adapted from IAMSAR Manual, Volume 1, Section 1.7)

- A regional approach can reduce cost and improve coverage and service.
- It is less complex and more economical and effective for States to share such resources as satellite facilities, long range communications and communication registration databases.
- States can support each other with SAR units to reduce the total number needed to ensure effective coverage.
- Training and other resources can be shared to mutual benefit.
- Every SRR needs an RCC, but every State does not necessarily need an RCC. States therefore have the option of sharing a single RCC that is supported by and serves more than one State. In such cases, individual States may establish a Rescue Sub-Centre (RSC).

Conclusions

It is in the national interest for every State to fulfil its obligation to provide basic safety services for its citizens and foreign travelers. Besides, SAR services are a good investment. When a disaster occurs and the news media provide extensive coverage to the world, the country will - rightly or wrongly - be judged on the effectiveness of its SAR response. In turn, effective SAR response is based on good planning and capable resources. This does not mean that each individual country must do that alone, however. A State does not even have to be a signatory to the International Convention on Maritime Search and Rescue in order to provide SAR services or participate in a regional arrangement. The documentary guidance exists and the procedures are well established. All that is required is a commitment to act, and a willingness to cooperate.

4. Benefits of Trans-Boundary Cooperation

The fourth session aimed to identify the various forms that trans-boundary cooperation can take, and some of the key elements in establishing it.

Forms of Trans-Boundary Cooperation

In the initial plenary discussion, Anthony Patterson outlined the types of formal and informal arrangements that are used to facilitate trans-boundary maritime SAR cooperation worldwide. In some places there are formal agreements between two or more States. In other cases there are simply tacit agreements when, for example, political considerations prevent formal cooperation.

Formal Approaches
One example of a formal approach is the inter-governmental and multi-agency Memorandum of Understanding (MOU) between Canada, the United Kingdom and the United States, a copy of which was given to the workshop participants. The full title illustrates how many agencies may have to be involved:

> *Memorandum of Understanding for Cooperation among the Department of National Defence of Canada, the Department of Fisheries and Oceans of Canada, the United States Coast Guard, the United States Air Force, the United Kingdom Maritime and Coastguard Agency, the United Kingdom Civil Aviation Division of the Department of Environment, Transport and Regions, and the United Kingdom Ministry of Defence, Concerning Search and Rescue.*

Guidance for creating such agreements is provided by the IAMSAR Manual, which even provides a sample model (in Annex I to Volume 1). Formal agreements on specific issues can also be implemented between authorities at the working level. One example is the *Memorandum of Understanding Concerning Search and Rescue Services Involving Offshore Petroleum Exploitation* that was signed in 2003 by the operational SAR coordinators of the Canadian and United States SRRs on the Atlantic coast (a copy of which was also provided to workshop participants).

Informal Approaches
Political differences between states need not - and indeed should not - prevent SAR cooperation. States have an obligation to provide effective SAR services, notwithstanding any political dispute between them. When formal arrangements are not possible, informal understandings can still be made. In strained international relationships ranging from Arab-Israeli to US-Cuban, responsible governments have permitted their SAR professionals to make limited but workable humanitarian arrangements at a working level.

Trans-Boundary SAR Cooperation and International Relations

"SAR provides an excellent means for promoting cooperation and communication among States and between organizations at local, national and international levels because it is a relatively non-controversial humanitarian mission. Cooperation in this area can lead to cooperation in other areas as well and can be used as a leadership tool for promoting good working relationships."

IAMSAR Manual Volume 1, Article 1.2.1(d)

Key Elements of Trans-Boundary Cooperation

In breakout groups, the workshop participants discussed some of the elements needed to establish effective trans-boundary SAR arrangements. They began by discussing some of the things that could go wrong, and then identified what could be done to make them go right. One of the most important elements identified was the need to establish some sort of operational agreement between the parties involved, either formally or informally. Another was regular meetings of people responsible for delivering SAR services. This is particularly useful because individuals who know each other personally can usually work together much more effectively in crisis than people who are strangers. Similarly, joint exercises and training also contribute to effectiveness. On a longer-term basis, establishing common standards and adopting compatible equipment could improve effectiveness and reduce costs.

Conclusions

In plenary discussion the participants compiled and discussed the breakout group findings and compared them to the sample agreement in the IAMSAR Manual. They also discussed how exercises, coordination meetings, and standardized equipment can facilitate trans-boundary cooperation. It was generally agreed that the most vital step in setting up any kind of trans-boundary cooperative arrangement is establishing personal professional contacts, even before a formal arrangement is signed. This can be done at an official level, but there is also value in having less formal gatherings - such as this workshop - in which professionals can interact as individuals and explore new ideas and approaches ideas without being bound to official positions. International examples range from the biannual meeting of the heads of the North Atlantic RCCs, to an annual Maritime Safety Colloquium in the Middle East and North Africa. In the Caspian region, this workshop itself has provided an excellent example of the value of exchanging information and ideas among regional maritime safety professionals.

5. Hazard and Risk Analysis

The fifth session stepped beyond the specialized area of Search and Rescue (SAR) to explore the broader principles of Emergency Management. The aim was not to attempt a comprehensive analysis of the region, but rather to identify some of the potential hazards relevant to the Caspian Sea region, and to consider the methodology that would have to be used to establish a good cooperative emergency management framework for the region.

Concepts

A presentation by David Griffiths introduced three emergency management concepts. The first was the "emergency management cycle" which can be applied to any emergency management problem, whether marine SAR or a major disaster. *Preparedness* is the phase before an event happens, during which the capacity to respond is built. *Response* aims to control the negative effects when an event does occur. *Recovery* is the return to normality after an event. *Mitigation* is the process of establishing mechanisms to reduce the severity and impact of future events. These four phases become a continuous cycle, as lessons from response and recovery for one event are applied to the mitigation and preparedness for the next.

The second concept was the ***all-hazards approach***, which means planning for the full range of potential hazards. It is generally more efficient to consider all possibilities rather than treating each eventuality in isolation. In that way planning is not duplicated, economies of scale can be achieved, and risks can be addressed comprehensively.

The third concept was ***risk analysis***. With a vast range of potential emergencies to consider, but only finite resources with which to address them, emergency managers need to identify each potential hazard and then analyze the risk arising from each. This can involve significant effort, because analyzing the risk for each hazard means identifying all the people and things that it threatens and then assessing the vulnerability of each of those elements. For example, severe storms are a hazard that can affect elements ranging from port facilities on the coast to vessels at sea. Of those vessels at sea, small and poorly maintained fishing boats may be far more vulnerable to a fierce storm than large, modern cargo ships. Although this analysis process requires a lot of individual work and cooperative effort, it is vital because it enables policy-makers and managers to prioritize their efforts and resources, and provides an objective framework for comprehensive planning.

Exercise

A detailed risk analysis of the Caspian Sea and its coastal regions would have been beyond the scope of this short, informal workshop. Nonetheless, the participants engaged in a brief hazards analysis exercise so that they could better understand the process that a cooperative regional emergency management forum would need to undertake. Two breakout groups were each provided with a map of the Caspian Sea and worksheets on which to list potential hazards relevant to SAR agencies, where these hazards might occur, the probability of their occurrence (on a scale of 0 to 5), and who or what might be vulnerable. For convenience, the following five categories of hazard were used.

Technological Hazards. Fires may occur anywhere: aboard ships, on offshore rigs, or in ports. Analysis of collision hazards, however, may need to consider where they are most likely to occur - at points of traffic congestion for example - and what impact they might have. Because the Caspian Sea lies below major air routes linking Europe and the Middle East with Asia, airliner crashes must be considered. Even possible trajectories of returning spacecraft may need to be assessed for potential risk. Ageing infrastructure such as wharves and petrochemical handling facilities may be a technological hazard, as are such human factors as poor technical training standards that can cause accidents.

Atmospheric and Hydrological Hazards. Storms can occur anywhere, but hazard analysis needs to consider such things as where they pose the greatest risk and where lesser risk may suggest places of refuge for endangered vessels. Visibility is a factor in safe navigation, therefore analysis of where and how often it may be reduced needs to be considered. The patterns, movement and annual trends of sea ice are another example.

Geological Hazards. Seismic activity in the Caspian region is localized in distinct belts along geological fault lines, therefore the risk from earthquakes is not the same everywhere. Maritime emergency managers need to analyze the risks specific to individual ports, pipelines, SAR facilities, etc.

Biological Hazards. The threat of epidemic or pandemic caused by infectious diseases should be as much a concern for maritime professionals as it is for medical experts. Marine managers must consider many and varied factors, from the spread of avian influenza by marine birds to the transmission of pathogens by passengers, crew, or ballast water of vessels. When health authorities are expressing such concern about a possible global pandemic, the very least that SAR managers must consider is safeguarding the health of their own people within their own organization.

Social Hazards. Hazards generated by human behaviour include such things as criminal activity, ideological violence in the name of religion or politics, and labour action that can disrupt normal operations or essential services.

Conclusions

In the concluding plenary, the hazards identified by each breakout group were compared and their relevance to maritime SAR discussed. The purpose of the exercise was not to attempt a comprehensive hazard analysis, since that would be beyond the scope of such a short workshop. Rather it was to familiarize the participants with the kind of methodology that would have to be used by many experts working cooperatively in all five countries to establish a credible and effective emergency management capability for all citizens of the Caspian basin.

6. Existing SAR and Other Emergency Management Arrangements

The sixth session was an informal exchange of information about arrangements for Search and Rescue (SAR) and the wider issue of emergency management in Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. Later in the day the group traveled to the Astrakhan Maritime Rescue Coordination Centre (MRCC Astrakhan) to view those facilities first-hand and learn in greater detail about the host country's SAR organization and capabilities.

Discussion

Experts from all five Caspian countries had been invited to participate in this workshop as professional individuals rather than as representatives of their respective organizations. The aim was to permit these SAR professionals to get to know each other at a personal level, and to exchange ideas in a candid, creative and innovative atmosphere. Consequently, each of the participants explained their own organizations and personal roles to their colleagues in an informal manner. No formal record of individual comments was recorded because it was recognized that published briefings on national arrangements would require staffing and approval by national authorities, while the purpose of this workshop was simply to enhance understanding among responsible individuals. In addition to participants from government agencies, representatives from the offshore oil and gas industry also described their organizations and capabilities.

Conclusions

The discussions indicated that there is a need to improve the sharing of professional and technical information among those responsible for SAR in the Caspian Sea. Not only are some government officials not familiar with the organization and capabilities of the equivalent national organizations in neighbouring countries, but also there are information gaps between government and industry. This means that many of the advantages of trans-boundary cooperation identified in the fourth workshop session are not being exploited. As the environmental experts pointed out, the Caspian Environment Program and the *Framework Convention for the Protection of the Marine Environment of the Caspian Sea* ("Tehran Convention") provide an excellent model which SAR professionals could consider. If Caspian SAR authorities decide that it would be useful to hold further workshops like this one, the formal exchange of information on SAR organizations, capabilities and contact points would be a valuable initial agenda objective.

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7. Environmental Protection and Response: Caspian Experience

The seventh session explored the links between Search and Rescue (SAR) incidents and marine environmental impact. It also examined lessons from environmental cooperation arrangements in the Caspian that might suggest models and precedents for SAR. Discussion covered the main principles of environmental protection and response, the similarities and differences between environmental protection and SAR operations, and such regulatory instruments as the *International Convention on Oil Pollution Preparedness, Response and Cooperation* (OPRC).

Discussion

The October 2002 sinking of the ferry *Mercury II* illustrated how SAR and environmental problems are often linked. The vessel capsized in a storm which, in addition to killing more than forty people, spilled up to 1,000 tonnes of crude oil into the delicate Caspian Sea environment. Considerable effort is being expended in the Caspian region to achieve environmental cooperation through such organizations as the Caspian Environment Program. In November 2003, the *Framework Convention for the Protection of the Marine Environment of the Caspian Sea* ("Tehran Convention") became the first pan-Caspian Convention to be signed by all five States. Although Article 13 of the Convention refers specifically to Environmental Emergencies, it could serve equally well as the starting point for a similar agreement for maritime safety because it says: "The contracting Parties shall take all appropriate measures and cooperate to protect human beings and the marine environment against consequences of natural or man-made emergencies." The Framework Convention could therefore serve as a precedent and starting point for cooperation in emergency management in general, and Search and Rescue in particular.

Conclusions

The oceanographic community has a mandate to cooperate under the obligation of Article 242 of the *UN Convention of the Law of the Sea* (1982) that requires States to "promote international cooperation in marine scientific research for peaceful purposes." Caspian States have done so very effectively through the Caspian environment program and related initiatives. There are similar obligations for SAR. Chapter Five of the *International Convention for the Safety of Life at Sea* (1974), calls on States "to ensure that necessary arrangements are made for distress communication and co-ordination in their area of responsibility and for the rescue of persons in distress at sea around its coasts" and requires ships to carry an up-to-date copy of Volume III of the *International Aeronautical and Maritime Search and Rescue Manual* (IAMSAR). Similar obligations exist under the *Convention on International Civil Aviation*. There is, therefore, a sufficient policy framework upon which States can construct formal cooperative SAR arrangements if they wish to do so, and the oceanographic and environmental communities have demonstrated how it can be done effectively.

8. Case Studies and Simulations

The participants conducted three desktop simulations to bring together the themes that had been discussed so far. The hypothetical scenarios involved incidents affecting vessels ranging from a Floating Production, Storage and Offloading (FPSO) unit to a large passenger ferry, all in situations occurring close to the boundaries of different national SAR areas of responsibility.

In each of these scenarios it became clear that cooperative arrangements between neighbours, even on an informal basis, could do much to save lives, property and the environment.

Further information on these and other simulations can be obtained from:

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9. Conclusions

The workshop concluded with a review of the topics discussed during the preceding four days and a discussion of whether the forum was of value and, if so, what might be done to continue the cooperative dialogue which it had begun.

The purpose of this technical workshop was to provide SAR and other emergency management professionals from the Caspian coastal countries with an opportunity to exchange information and ideas in an informal, non-official setting. Consequently, it was not intended to make formal recommendations to national authorities.   Nonetheless, four days of intensive professional dialogue among highly qualified experts did show clearly that there would be considerable value to all Caspian states in having some sort of ongoing forum in which professional maritime safety experts could address their mutual technical and professional challenges cooperatively.

Humanitarian Obligation
Search and Rescue is a humanitarian endeavor and international obligation that should be insulated from political issues. This kind of humanitarian cooperation contributes positively to all states' interests by enhancing the physical security of their citizens, both individually and collectively. Around the world, established state practice is to manage maritime safety independent of political differences.

Non-Political Nature
Search and Rescue Regions are defined without prejudice to national boundary claims, as ICAO aeronautical SAR arrangements have already done over the Caspian. There are examples worldwide in which even hostile governments have at least tacit understandings which permit their maritime safety professionals to cooperate in saving lives, mitigating the results of pollution, and ensuring the safe passage of shipping. Consequently, there is no political impediment to following the example of Caspian environmental agencies in establishing either formal or informal cooperative SAR arrangements. The multi-party Framework Convention appears to provide an excellent precedent for cooperation and could, perhaps, serve as either the model or the vehicle for developing a Regional SAR agreement.

Benefits of Cooperation
It was evident from discussion that no single country has enough resources to deal with every potential major disaster. With human life and economic well-being at stake, cooperation is a logical and simple means of making maximum use of limited resources. Creating an effective cooperative maritime safety network need not rely on great expense or high technology. Rather, it is a matter of creating an effective organization that can bring all existing resources to bear on a crisis in the fastest and most effective manner. This requires the kind of prior preparedness and planning that this workshop was intended to foster.

The Future

There was a clear consensus among the participants that it would be desirable to have a maritime safety technical forum in the Caspian region, with a workshop such as this becoming a regular event. A number of specific proposals were suggested for informal exploration among the participants, and through them to national authorities. These included the following.

- Following the example of the *Framework Convention for the Protection of the Marine Environment* to establish a formal SAR cooperative arrangement.
- Even without a formal arrangement, establishing an informal technical Caspian maritime safety forum in which SAR professionals can meet regularly and communicate freely to share information and ideas.
- Establishing a mechanism to collect and exchange SAR information in a similar manner to the Caspian Environment Program's data and analysis initiatives.
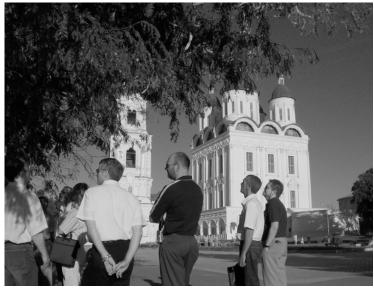
In addition, there was a suggestion that SAR experts from all Caspian countries could be invited to participate in a SAR and oil spill exercise planned for the northern Caspian Sea in August or September 2006.

All of these ideas will be pursued by the organizers of the workshop. Meanwhile, the facilitators agreed to write and publish these Proceedings. All participants agreed in principle to work toward holding another session in the autumn of 2006, if appropriate funding can be identified.

Plenary Discussion

Visiting the Astrakhan Kremlin

Visiting MRCC Astrakhan

Appendix
PARTICIPANTS

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