

## TIEMS: ITS EVOLUTION AND CHALLENGES

**K. Harald Drager**

*A/S QUASAR Consultants<sup>1</sup>*

### 1. Abstract

This paper briefly describes the origins of TIEMS, and of its progress over the years in providing a forum for interactive discussion by experts in emergency management. The Society's current strengths and weaknesses are detailed and have been used to determine what is needed to ensure the continued development of the Society to the benefit of the participants and the international emergency management community.

Set in the context of the needs of the international emergency management community, a vision for the future is provided, and a proposed plan and time schedule for achieving the objective of developing TIEMS into one of the leading contributors to the international emergency management community.

### 2. Background

In the early nineties, The Society for Computer Simulation (SCS) provided a forum for discussing and promoting simulation techniques in Emergency Management during their annual multi conferences. During their 1992 conference in Orlando, at their session on simulation, organised by Jim Sullivan, I presented a paper on the simulation of evacuation processes from offshore platforms. About 50\* participants attended, of which the majority were Americans, with a few Europeans. We were a lively and interactive group, and I was pleased to be offered the opportunity of presenting a further paper at the following year's conference to be held in Washington D.C. At the time I decided that although SCS made a useful contribution to emergency management simulation, it was not the ideal vehicle for promoting emergency management in a global perspective.

### 3. Establishment of TIEMS

During the preparatory phase for the 1993 conference, I suggested to Jim Sullivan that, in addition to the SCS, there was a need for a uniform international society to provide a forum for the presentation and exchange of emergency management ideas, and based on global needs. I proposed the name, The International Emergency Management and Engineering Society (TIEMES), and suggested forming a selective group during the Washington conference.

Jim Sullivan subsequently promoted the idea to a number of participants, and we met in the margins of the conference. The Society was thus formed, mission statement and by-laws agreed. At the end of the SCS conference we held our inaugural meeting at which Jim Sullivan was elected President and I was elected International Vice President. We decided that our first conference should be at Fort Lauderdale in Florida in 1994.

---

<sup>1</sup> Østvangveien 29, 0588 Oslo, Norway email: [khdrager@online.no](mailto:khdrager@online.no)

#### **4. The first years**

TIEMES' first conference in Florida attracted about 100\* participants from America, Europe and Asia, and some commercial exhibitors. It was widely considered to be a successful beginning for the Society. The theme was, "Bridging the Gap between Theory and Practice: Research and Applications", and the papers were subsequently published. Suleyman Tufekci, the Society's treasurer, also became the first editor of our newsletter, "Carpe Diem", and copies were distributed at the conference.

The Society succeeded in establishing cooperative links with the IEEE System, Man, and Cybernetics Society, the Operations research Society of America (ORSA), the Institute of Industrial Engineers (IIE), the Association of the European operational Research Societies (EURO), the National Institute for Urban Search and Rescue, The University of Florida, the EUREKA Program for Research and Development in Europe, the Directorate-General XIII (Telecommunication, Information Market and Exploitation of Research) and III (Industry) of the Commission of the European Communities.

Although we were still in the embryonic stages of developing the Society, the participants in Florida were highly complimentary about the content and outcome of the conference. There was considerable enthusiasm for our next annual conference to be held in Nice, France, where the theme would be, "Globalisation of Emergency Management and Engineering: National and International Issues concerning Research and Applications".

In Nice, approximately 120\* participants attended. A new Board was elected under the Presidency of Jean Luc Wybo. The Society's name was changed to The International Emergency Management Society (TIEMS).

Our first meeting as TIEMS was the 1996 conference in Montreal, Canada, under the theme, "International Issues concerning Research and Application". Approximately 60\* participants attended.

The next conferences were as follows:

- In 1997 in Copenhagen Denmark under the theme: National and International Issues concerning Research and Applications. The conference organizer was Verner Andersen, and some 60\* participants were present
- In 1998 in Washington D.C. under the theme: Disaster and Emergency Management, International Challenges for the next Decade. The conference organizer was John R. Harrald, and some 120\* participants were present.
- In 1999 in Delft, The Netherlands under the theme: Contingency, Emergency, Crisis, and Disaster management, defining the Agenda for the Third Millennium. The conference organizer was Giampiero E. G. Beroggi, and some 80\* participants were present.
- In 2000 in Orlando, Florida under the theme: Contingency, Emergency, Crisis, and Disaster Management; defining the Agenda for the Third Millennium. The conference organizers were Suleyman Tufekci and Kathleen M. Kowalski, and some 60\* participants were present.
- In 2001 in Oslo, Norway under the theme: Towards Cooperation and Global Harmonization. The conference organizer was K. Harald Drager, and some 200 participants were present.

\* Approximation of numbers based on memory.

#### **5. The present situation of the society**

TIEMS is arranging its 9<sup>th</sup> international conference this year in Waterloo, Canada. Organised by Ross Newkirk, the theme is, "Facing the Realities of the Third Millennium". At last year's

conference I was given the mandate to propose an international development plan for TIEMS, and to set out a vision for the society in a global context. Therefore, a special plenary session will be devoted to discussion on the future of the society.

This issue has become increasingly important following the events of last year. The terrorist attack on the USA on 11<sup>th</sup> September 2001 has changed the world. It highlighted the need to be ready and adaptable to deal with new challenges and circumstances. And so it must be with this Society. It is imperative that we remain in close touch with international developments through increased cooperation and participation. Indeed, we have the skills, experience, innovation and potential to become one of the leading contributors to Global Emergency Management.

Our future development should be determined in the context of our current strengths and weaknesses:

#### The strength of TIEMS

- TIEMS is a true international society. Participants from 28 countries attended the conference in Oslo last year
- The papers presented at the TIEMS conferences are of high quality, and many of these have been accepted for publication in several recognized international publications
- Participants represent a unique blend of expertise and experience, covering a broad spectrum of emergency management, including natural hazards and man-made disasters
- TIEMS provide an annual global meeting place for emergency management specialists that enables interactive and lively discussions during the conferences and associated social events/programmes
- The Society has survived in an increasing competitive environment, where other international organisations are competing for participants

#### The weaknesses of TIEMS

- There are too few attending practitioners and representatives of the authorities, international organisations, industry and exhibitors at the annual conferences
- TIEMS has a weak economic base, resulting in too much reliance on voluntary contributions
- No activity programme other than an annual conference is offered
- No formal membership is offered, and the Society has no structured policy regarding sponsors
- The mission statement and by-laws are not up-to-date and need to be revised in line with the development of international emergency management community
- The Internet home page of the Society is under-utilised

The inherent strengths of the Society have enabled us to survive in an increasingly competitive environment. By addressing our weaknesses we can generically develop the Society into a globally recognised organisation with credibility and the capability of meeting the current and future needs of the international emergency management community.

### **6. The international emergency management community**

The international emergency management community can be categorized into a number of different users, providers and financiers:

- National emergency management organisations
- Public authorities
- International organisations dealing with emergency management
- Humanitarian organisations with need for emergency management

## The International Emergency Management Society

*9<sup>th</sup> Annual Conference Proceedings*

*University of Waterloo, Canada, May 14-17, 2002*

- Industry providing emergency management software and hardware systems and equipment
- International and national emergency management societies
- Emergency management practitioners
- Universities offering courses and doing emergency management research
- International institutions that may finance emergency management projects
- Any other affiliated or interested groups

The aforementioned categories have different needs. However, there is one common requirement, a meeting place for the exchange of ideas and appraisal of new and innovative developments within emergency management.

To determine the challenges TIEMS faces in meeting these needs, preliminary research of the different groups has been undertaken. Summarised below, this market research should be an ongoing task as part of a future development plan.

### National emergency management organisations

Some countries have organised their public emergency management activities in separate institutions, such as the United States Federal Emergency Management Agency (FEMA). Founded in 1979, its main mission is “to reduce loss of life and property and protect our nation’s critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery”. FEMA is an independent US federal agency with more than 2600 full time employees (Washington, regional and area offices etc.). In addition, FEMA has nearly 4000 standby disaster assistance employees. FEMA often works in partnership with other organisations.

After the September 11<sup>th</sup> - terrorist attack, the US Government established the Office of Homeland Security (responsible for overall coordination and policymaking) with the purpose of shaping a national strategy and coordinating efforts between all related bureaus. The Office of Homeland Security has close connections to The White House, civilian agencies and the intelligence community. Homeland Security oversees Aviation security, Command, Control and Communication (C3), Detection & Prevention, First Response (inclusive of FEMA), Emergency Management (inclusive of FEMA), Energy Security, Perimeter Security, Bio/Chem & Nuclear/Radiation Security, Water and Agricultural Security and other fields, such as Maritime Security etc.

### Public authorities

Most countries maintain a traditional sector approach in their organisational structure within respective public authority administrations. The responsibility to cope with prevention is delegated according to a silo based approach between several ministries and directorates according to the nature of the threat, such as natural disasters (earthquakes, hurricanes, cyclones, volcanic eruptions, floods, wood fires, landslide, avalanche, etc) or man-made disasters (e.g. explosions, transport disasters in aviation, maritime, rail or road traffic, fires in hotels, restaurants, etc). This practice is often found in the organised public safety boards charged with the responsibility to investigate disasters and promote recommendations to prevent further accidents. General national or multi-modal safety boards in the transport field are still limited to less than ten countries.

### International organisations dealing with emergency management

Two organisations, which play a major role:

- *United Nations*: In 1997, the United Nations, as part of the Secretary-General’s programme for reform, established The Coordination of Humanitarian Affairs (OCHA). This succeeded the Department of Humanitarian Affairs (DHA) that had responded to 416 natural disasters from 1992 through 1997. OCHA’s headquarters staff (137) is divided

## The International Emergency Management Society

*9<sup>th</sup> Annual Conference Proceedings*

*University of Waterloo, Canada, May 14-17, 2002*

between New York and Geneva in Switzerland, and has a core annual budget of \$ 42.4 million. The number of field staff is 51.

Coordinators function are focused in three core areas: policy development and coordination; advocacy of humanitarian issues with political organs; and coordination of humanitarian emergency response on the ground. OCHA discharges its coordination function primarily through the Inter-Agency Standing Committee (IASC). OCHA currently maintains field coordination arrangements in 16 countries and one geographical region. Among information tools administered by OCHA, is the Humanitarian Early Warning Systems (HEWS), which identifies crises with humanitarian implications. HEWS is supported by an extensive database of information for more than 100 countries. Another tool is the Integrated Regional Information Network (IRIN). Based in Nairobi, it distributes daily reports to more than 50 countries.

In addition, the UN Secretariat for the International Strategy for Disaster Reduction (UN/ISDR) plays an important role as an inter-agency task force for the implementation of the strategy concerning disaster reduction. The Task Force is composed of several representatives from organisations and geographical regions and has four working groups.

- *NATO/Partnership for peace council*: The European Atlantic Partnership Council (EAPC) consists of 46 member states; 19 NATO countries and 27 Partnership for Peace Countries (PFP). The EAPC has decided to establish a European Atlantic Disaster Response Control Centre (EADRCC), which has been mandated to deal with two major emergencies simultaneously and coordinate the request, mobilisation and deployment of the EAPC response to a request for assistance from a stricken country. This could include both EAPC national assets and European Atlantic Disaster Response Unit (EADRU).

The EADRCC will deal with natural and industrial disasters as well as chemical, biological and radiological (CBR) attacks. The focus will be on protection of the population and civilian and humanitarian support. The EADRCC program will be discussed and concluded on the EAPC meeting in Prague in November 2002.

This program could lead to a development of a disaster response network comprising all EAPC member states.

### Humanitarian organisations with need for emergency management

One internationally recognized organisation:

- *Red Cross*: The International Federation of the Red Cross and Red Crescent Societies consists of a secretariat (230 persons with one division for Disaster Management and Coordination) in Geneva (Switzerland) and several field offices around the world. The ICRC (800 headquarters staffs) has permanent delegations in about 70 countries and has conducted operations in about 80 countries with about 10 000 field staff. In addition to the traditional Red Cross organisation, several other international and national non-governmental organisations participate in the humanitarian emergency assistance in several places throughout the world.

### Industry providing emergency management software and hardware systems and equipment

One major international industrial organisation, delivering a holistic approach to hardware and software emergency management systems:

- *Silicon Graphics Inc (SGI)*: SGI was incorporated in 1982, and has its main office in Mountain View, California. SGI has 4700 employees and is present in 50 countries. The company's turnover in 2001 was US\$ 1.9 billion.

SGI's solutions to government areas and defence are focused on three disciplines: visual simulation, geographic information systems, and decision support. SGI's traditional strengths in high-performance graphics systems, scalable high-performance compute capability, and large-scale data storage are the ideal ingredients for the modern, 21<sup>st</sup> century military operating in a digital battlefield. Information dominance is the goal of SGI's solutions – understanding the situation and providing an environment for rapid, confident decision making.

SGI decision support centres offer the capability to efficiently and seamlessly deal with huge quantities of information, maps, imagery, GIS data, video, audio, and weather. The wide field of view offered by SGI's large format of high-resolution displays provides the ultimate in situation awareness. SGI's Reality Centre solutions support government and defence users worldwide with decision-support solutions in:

- Command and control
- Disaster and crisis response
- Mission operations
- Briefing and presentation centres

SGI has installed more than 400 Reality Centre facilities worldwide and can provide design, development, engineering, software, integration, installation, delivery, operations, and maintenance engineering for decision-support systems.

#### International and national emergency management societies

As one example, The International Institute of Risk and Safety Management, established in 1975 in the UK, has more than 5 500 members in over 50 countries throughout the world. The institute's main objective is to advance public education in accident prevention and occupational health. Membership is based on a personal basis, from students to professionals in the safety management field.

#### Emergency management practitioners

Practitioners organised in special organisations can be categorised into four major groups: 1) Humanitarian relief organisations - International Red Cross, Friends (Quakers) Disaster Service, The Salvation Army, Medicines sans Frontiers, Save the Children, and several others 2) Professional groups - manufacturers/producers of highly relevant equipment in preparedness or disaster reduction, engineers, fire fighters, disaster and emergency medical personnel, geologists, psychologist etc. 3) Resource personnel with special skills - planning, local community organising, training specialists, on-spot emergency work etc. 4) Volunteers - radio amateurs, women groups, local emergency groups etc. Collectively, there are several hundreds of organisations and players in these groups, constituting a very complex picture.

#### Universities offering courses and doing emergency management research

Research programme and projects and academic courses in emergency management are growing disciplines, which are integrated in the schedules of several universities throughout the world. Usually, the themes reflect the risk profile in their respective region or country. Topics within the emergency management area can now be found at several universities, especially in USA and Canada, Great Britain, The Netherlands, India and Australia. In addition to academic studies, several universities and other institutions offer learning programmes and courses in emergency proficiencies.

#### International institutions that may finance emergency management projects

Two financial organisations supporting emergency management projects:

- *World Bank/International Finance Corporation (IFC)*: Since its foundation in 1956, the IFC has committed more than \$ 29 billion of its funds and has arranged \$ 19.2 billion in syndications and underwriting for 2446 companies in 136 development countries. IFC coordinates its activities with the other institutions in the World Bank Group – the International Bank for Reconstruction and Development, the International Development Association, and the Multilateral Investment Guarantee Agency – but is legally and financially independent. Its 174 member countries provide its share capital and collectively determine its policy.

Since the 11<sup>th</sup> September 2001 attack on USA, it is expected that emergency management will become part of their agenda. Both World Bank/IFC personnel and emergency management personnel in the development countries should be target groups for TIEMS.

- *The European Union*: Within the European Union, the responsibility for emergency management is divided between several Directorate-Generals governed by the European Commission. However, the main responsibility for activities concerning external development aid rest with the new EuropeAid Co-operation Office (ECHO), formally established on 1. January 2001. But this new body has no responsibility for humanitarian activities or security policies inside the European Union. This is devolved to the Directorate-General for Justice and Home Affairs. The new Police Unit – EUROPOL – is playing an important role in fighting terrorism and international crime. The EU Unit Humanitarian Security (HS) has as its mission to provide an independent technical reference, offering measurement resources for validation of methods and data in applications related to among others natural hazards. HS is serving several DGs and the EuropeAid Co-operation Office. Another important body is The Institute for the Protection and the Security of the Citizen (IPSC), which has as its mission to provide research-based, system-oriented support to EU policies so as to protect the citizen against economic and technological risk, including, amongst others, potential damage caused by natural disasters or human activities. IPSC came into being on 1<sup>st</sup> September 2001, and is located at ISPRA in Italy.

The above gives a snapshot of the variety of emergency management community. It would also indicate that TIEMS could provide a suitable forum for groups and individuals where interactive discussion and state of the art information technology would be on offer. Combined with activity programmes that add real value, TIEMS would become an attractive proposition for many groups within the international emergency management community.

## 7. Current and future challenges

Preliminary analysis would indicate that there is a considerable need for an international emergency management meeting and market place. TIEMS currently appeals to only a small segment of the market, struggles with a weak economy, and has no clear and unified vision for the future.

I have therefore in the following concentrated on key areas of weakness, and propose an action plan and schedule that I believe is necessary for the generic development of TIEMS.

The proposed plan of action is not definitive, but is of course a proposal, and will be subject to further discussion and improvements agreed by TIEMS Board of Directors and TIEMS supporters/members.

**The International Emergency Management Society**

*9<sup>th</sup> Annual Conference Proceedings*

*University of Waterloo, Canada, May 14-17, 2002*

Improvement of TIEMS economy

A sound economic base is essential for the further growth and development of TIEMS, and should be one of the top priorities. Annual conferences alone cannot provide sufficient income and other sources should be investigated.

A membership programme has been proposed by Kathleen Kowalski, and this will be one step in the right direction. However, we should also investigate the possibility of attracting sponsors. The benefits to a sponsor would be promotion in TIEMS' publications and Internet home page, in addition to exposure at annual conferences.

Partnership with other organisation(s)

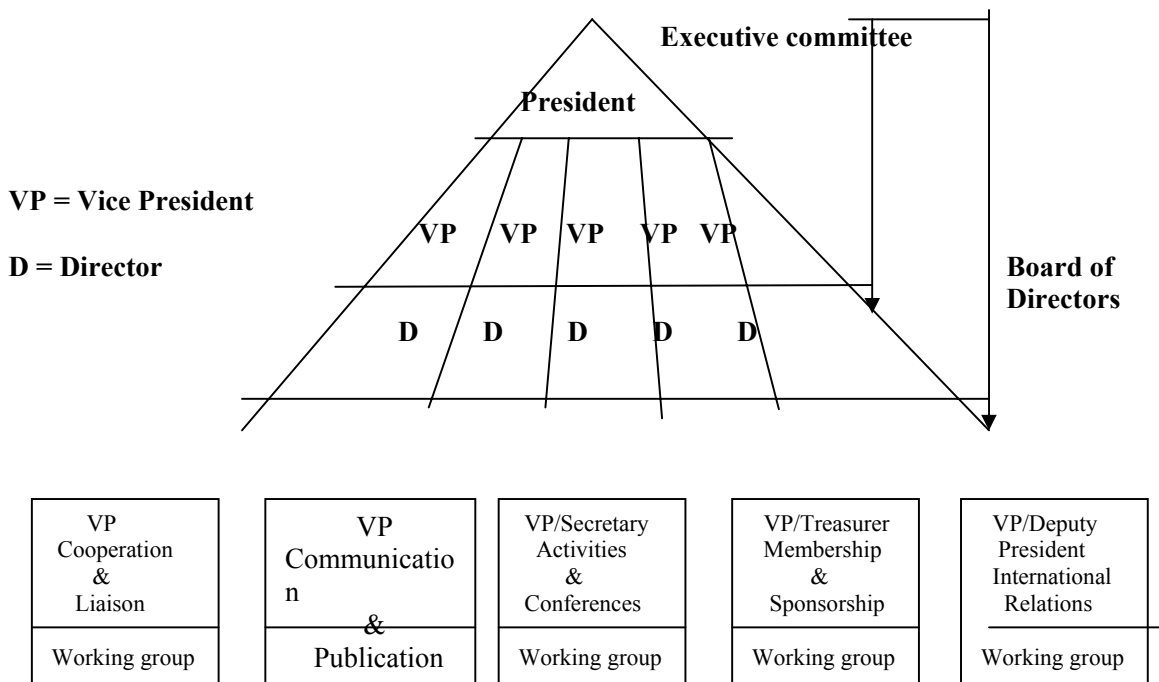
The effectiveness of TIEMS and its capability to develop is restricted by its current economic base, and limited by the number of man-hours that are voluntarily offered each year by various individuals. Broadening and strengthening our relationship with multi-national organisations and their associated funding sources might be one way of alleviating this problem. It will be important to maintain the very special character that constitutes TIEMS, but closer cooperation with other groups will require us to be flexible in our approach and tailoring our strategy and aims accordingly. This will need to be explored further in the coming year, including determining what would constitute the most suitable of the international emergency organisations for cooperation.

Further globalisation of TIEMS

In addition to a sound economic base, a dedicated and focussed leadership is vital for success. This means clearly defining the work tasks and ensuring equitable delegated responsibility to the Board of Directors. It will also require the establishment of permanent and ad hoc working groups for the spreading of workload and stimulation of ideas.

Ultimately, a global organisational infrastructure should be established, consisting of Regional and National chapters as the fundamental elements to strengthen and add value to the central core organisation.

A TIEMS organisation might be constructed as follows:





Director Australia & Pacific	Director Europe	Director Asia	Director Africa	Director America
Regional board	Regional board	Regional board	Regional board	Regional board

#### Proposed Strategic Program and Action Plan

TIEMS should ideally develop a long-term strategy covering a 5 year period, inclusive of a clearly defined mission statement and related intermediate term targets and activity. But this can only be achieved if all participants/members collectively contribute to the process. Further work on this issue should be undertaken by a working group under the responsibility of the Vice President to the Secretariat with the aim of producing draft proposals for consideration by the Board of Directors at the next international conference. A recommendation would then subsequently be presented to the Annual Assembly in 2003 for confirmation.

#### Global, Regional and National Conferences

A global and decentralised TIEMS will necessitate a review of the annual conference programme. In the first instance, the establishment of Regional and National groups is likely to result in localised conferences, and probably on an annual basis. The attractive spin-off would be more comprehensive recruitment for a global conference.

I therefore propose that Regional/National conferences be held annually, and global conferences every other year. The global conference should then alternate to the different regions/nations including the Australian Pacific Region which to date has been largely ignored.

This conference programme should lead to more participants because of more advanced planning and awareness.

The global conferences should continue to last for 4 days, while the regional/local conferences should be shorter, e.g. 1, 2 or 3 days, subject to the views of members and expectation of the numbers of participants attending.

#### Internet Home Page Activity

Most serious international and national emergency institutions, organisations, associations and institutions with emergency management as a sector activity, such as universities, book companies, consultancy institutions, newspapers, journals, etc, have established their own internet home pages to promote and inform about their activity, such as TIEMS. But unlike TIEMS, most of these Internet home pages are regularly updated. Many of these institutions utilise the Internet as one of their most important communication channels, using frequent updating to attract and retain thousands of interested readers. At present, Internet gives users throughout the world access to several different type of information:

- databases of disasters
- preventive real time information (weather forecast/ warnings, etc)
- organisational information, (history, policy, programme, activity, publications)
- academic schedules
- articles/papers
- membership information

- trade union activities
- methods and tools
- statistical information

Some of the homepages offer an open forum for discussion, like The Virtual Forum, created by the Emergency Information Infrastructure Partnership, which offers information and tools from academia, business, government, and volunteers.

Recognition should be made of Michael Bittle's considerable voluntary effort in designing, hosting and updating TIEMS' present home page, as and when information is received.

Consequently, TIEMS currently publishes fairly conventional, conference focussed communication via [www.tiems.org](http://www.tiems.org). The potential for improvement is considerable.

## **8. Recommendations**

The above vision and proposals for development of TIEMS requires thorough discussion both within the Board of Directors and at a plenary session of the Waterloo conference. In this context, participants should be mindful of the fact that expeditious decisions are necessary for the future development of TIEMS to be undertaken.

Therefore I propose a two years plan of action and time schedule for the revision and development process as follows:

### Issues to be raised at the coming TIEMS annual meeting

- Agree on revision of the by-laws and mission statement
- Extend the board to eleven Directors
- Elect the President who will have the overall responsibility for TIEMS development
- Elect the Vice Presidents and determine responsibilities
- Appoint Regional Directors
- Agree the membership programme as proposed by Kathleen Kowalski
- Elect working groups responsible for:
  - TIEMS activity programme, revision of by-laws and mission statement
  - Cooperation and Liaison action plan
  - Communication and publication strategy
  - Membership and sponsorship strategy
  - Regional/National development programme
- Agree on permanent secretarial services to the society
- Agree conference programme and responsibilities

### Time schedule

- All working groups to serve a two year term
- All working groups to detail their progress on TIEMS home page

## **9. Acknowledgement**

I am grateful for the significant contribution from Sverre Roed-Larsen who carried out research to summarise the international emergency management community and helped determine the strategic programme, action plan, Internet home page activity and relevant references.

## 10. Conclusions

A review of the Emergency Management Community, and set in the context of the events of the last year, confirms the view that TIEMS has a significant role to play. Increased discussion, planning and action on an international scale between the various individuals and organisations can only benefit the community as a whole, and TIEMS as a Society. Individually, we will each benefit from more widespread contact and access to alternative knowledge and skills.

It is clear that intrinsically we have the core skills, experience and potential to develop TIEMS into a credible worldwide organisation. Providing we work together, it is possible to provide an infrastructure and activity programme within a reasonable timescale, and that will be an attractive proposition to all those involved in Emergency Management.

## 11. References

*Examples only – universities, libraries, training schools, business companies, journals etc. are excluded*

ABBR.	NAME	WEB-ADDRESS
International organisations		
OCHA	UN Office for the Coordination of Humanitarian Affairs	<a href="http://www.reliefweb.int/">www.reliefweb.int/</a>
ISDR	International Strategy for Disaster Reduction	<a href="http://www.unisdr.org/">www.unisdr.org/</a>
IAEM	International Association of Emergency Managers	<a href="http://www.iaem.com/">www.iaem.com/</a>
DERA	The Disaster Preparedness and Emergency Response Association, International	<a href="http://www.disasters.org/dera/">www.disasters.org/dera/</a>
ESRA	European Safety and Reliability Association	<a href="http://www.esrahomepage.org">www.esrahomepage.org</a>
ESReDA	European Safety, Reliability & Data Association	<a href="http://www.vtt.fi/aut/tau/network/esreda/esr_home.htm">www.vtt.fi/aut/tau/network/esreda/esr_home.htm</a>
EAAP	European Association for Aviation Psychology	<a href="http://www.eaap.net/">www.eaap.net/</a>
LACDE	Local Authorities Confronting Disasters & Emergencies	<a href="http://www.ulai.org.il/_aced.htm">www.ulai.org.il/_aced.htm</a>
RAPA	The Risk Assessment and Policy Association	<a href="http://www.piercelaw.edu/tfield/rapa.htm">www.piercelaw.edu/tfield/rapa.htm</a>
IIRSM	The International Institute of Risk and Safety Management	<a href="http://www.iirsm.org">www.iirsm.org</a>
IFRC	International Federation of Red Cross and Red Cross Crescent Societies	<a href="http://www.ifrc.org">www.ifrc.org</a>
IRCD	International Research Committee on Disasters/ISO	Sociweb.tamu.edu/ircd/
National Emergency organisations		
FEMA	US Federal Emergency Management Agency	<a href="http://www.fema.gov/">www.fema.gov/</a>
NTSB	US National Transportation Safety Board	<a href="http://www.ntsbt.org/">www.ntsbt.org/</a>
NEMA	The National Emergency Management Association	<a href="http://www.nemaweb.org/">www.nemaweb.org/</a>
FAA	US Federal Aviation Administration	<a href="http://www.faa.gov/">www.faa.gov/</a>
EMA	Emergency Management Australia	<a href="http://www.ema.gov.au/">www.ema.gov.au/</a>
EPC	Emergency Preparedness Canada	<a href="http://www.epc-pcc.gc.ca/">www.epc-pcc.gc.ca/</a>
ARC	American Red Cross	<a href="http://www.redcross.org/services/disaster">www.redcross.org/services/disaster</a>
Others – such as Information centres etc.		
EPIX	Information Preparedness Information exchange	Epix.hazard.net/
CRID	The Regional Disaster Information Centre for Latin America and the Caribbean	<a href="http://www.crid.or.cr">www.crid.or.cr</a>
ADRC	The Asian Disaster Reduction Centre	<a href="http://www.adrc.or.jp">www.adrc.or.jp</a>

## The International Emergency Management Society

*9<sup>th</sup> Annual Conference Proceedings*

*University of Waterloo, Canada, May 14-17, 2002*

	Disaster Warning Network	<a href="http://www.disasterwarning.com/">www.disasterwarning.com/</a>
	Global Disaster Watch	<a href="http://www.angelfire.com/on/predictions/">www.angelfire.com/on/predictions/</a>
	The s Natural Hazards Research and Applications Information Centre	<a href="http://www.colorado.edu/hazards/intro.html">www.colorado.edu/hazards/intro.html</a>
	Relief	<a href="http://www.reliefweb.int/">www.reliefweb.int/</a>
GDIN	Global Disaster Management Network	<a href="http://www.gdin.org/">www.gdin.org/</a>
EIIP	The Emergency Information Infrastructure Partnership	<a href="http://www.emforum.org/">www.emforum.org/</a>
IPW	Injury Prevention Web	<a href="http://www.injurypreventionweb.org">www.injurypreventionweb.org</a>

### 12. Biography

K. Harald Drager is the Managing director of A/S QUASAR Consultants, established in 1983, and having delivered software solutions internationally for emergency and risk management. He has a master's degree in control engineering from the Norwegian Technical University in 1966 and a master's degree from Purdue University in industrial engineering in 1973.

His specialisations are international business development, emergency and risk management, chemical hazard communication and project management. He is doing consultancy work amongst others for the World Bank/International Finance Corporation and NATO, and has been project manager of several international research and development projects for software development in risk and emergency management.

He was active in establishing TIEMS in 1993, and has been the International Vice President of TIEMS since its inauguration.

He has published numerous papers on emergency and risk management.