1990

Proposal for the further improvement of fire fighting training at the Regional Academy of Maritime Science and Technology, Abijan, Cote d'Ivoire

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A PROPOSAL FOR THE FURTHER IMPROVEMENT OF FIRE FIGHTING TRAINING AT THE REGIONAL ACADEMY OF MARITIME SCIENCE AND TECHNOLOGY, ABIDJAN, COTE D'IVOIRE

by

Tiemele Allah

Cote d'Ivoire

A paper submitted to the Faculty of the World Maritime University in partial satisfaction of the requirements for the award of a

MASTER OF SCIENCE DEGREE

in

MARITIME EDUCATION AND TRAINING (NAUTICAL).

The contents of this paper reflect my personal views and are not necessarily endorsed by the UNIVERSITY.

Signature: [Signature]

Date: 30 October 1990

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A PROPOSAL FOR THE FURTHER IMPROVEMENT OF FIRE FIGHTING TRAINING AT THE REGIONAL ACADEMY OF MARITIME SCIENCE AND TECHNOLOGY, ABIDJAN, COTE D'IVOIRE

By

Tiemele Allah

MET (N) 90
DEDICATION

FIRSTLY TO THE MEMORY OF MY LATE FATHER
KOUAME TIEMELE LEON;

NEXT, TO MY BELOVED MOTHER;

FINALLY, TO MY DEAREST WIFE, WHOSE ENCOURAGEMENT
AND HELP MADE THIS WORK POSSIBLE;

AND TO MY LOVELY DAUGHTER,
EVELYNE SANTIA.
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ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and thanks to all person whose efforts helped me with their guidance, encouragement, information and effort in the elaboration of this paper.

In particular I am sincerely grateful to:
- the person involved in the Maritime Education and Training System in Cote d'Ivoire whose efforts and interest give me the opportunity to attend this course; especially Mssrs.
- Souleymane Sogodogo, General Director "RAMSTA"
- Andre Blavec, Ex-General Inspector of Maritime Education and Training in Cote d'Ivoire, and presently Deputy Director "Ecole Nationale de la Marine Marchande du Havre"
- G. Bouriel, IMO/UNDP consultant at the RAMSTA in Cote d'Ivoire.

I am extremely grateful to:
- my assessor Professor Günther Zade, Vice Rector and Academic Dean for his valuable direction and guidance without which this paper could not have been completed,
- Professor Jef Mulders, my course Professor for his support and encouragement,
- the English teachers, especially Clive Cole for his linguistic supervision.

I am particularly grateful to Captain Ahimon Joël, Director of Studies "RAMSTA" who co-assessed my project.
I would also like to thank my course colleagues for their support during our two years of study.

Special thanks to my mother, brothers, sisters and fellows especially Tahoe N'gnanzou, Pilot in the port of Abidjan for their support and encouragement, finally, my wife and my daugter for their immense support.
ABSTRACT

This paper deals with a proposal for the further improvement of fire fighting training at the Regional Academy of Maritime Science and Technology (RAMST) in Abidjan, Cote d'Ivoire.

On board merchant marine ships, fire has always been and is still a serious danger for passengers, crew, cargo and vessel. Most of the time, the consequences are tragic: loss of human life, loss of property and productivity. The lack of training of the crew in fire fighting is very often one of the significant factors pointed out during investigations which follow such accidents. Therefore more attention should be paid to the training of the crew.

To compensate for the lack of training due to the lack of facilities and equipment up to 1987 at the RAMST at Abidjan, some refresher courses are essential for the former graduates from the academy. These courses will offer a suitable and adequate means for the acquisition of new knowledge and skills which will contribute to improving safety standards and efficiency on the job.

I also believe that this paper may provide valuable information and guidelines for the instructors in charge of the fire fighting department.
The contents of this paper have been divided into five chapters:

Chapter One deals with the introduction.

Chapter Two describes the development of the Maritime Education and Training in the West African Francophone Region.

Chapter Three deals with the need for fire fighting training and refresher courses at the Regional Academy of Maritime Science and Technology, Abidjan.

Chapter Four deals with the requirements for the implementation of basic fire fighting training and refresher courses, intermediate and advanced fire fighting upgrading and refresher courses at the Regional Academy of Maritime Science and Technology, Abidjan.

Chapter Five gives the conclusion and recommendations.
1. INTRODUCTION

According to statistics, fires and explosions aboard merchant marine ships which represent serious dangers not only for seafarers but also for the ship and its cargo, entail more deaths than any other type of disaster.

In view of the increase in the number of accidents due to fire on board ships, the International Maritime Organization (IMO) is still working through conventions, codes, recommendations and other legal instruments in order to improve the safety of international shipping and to save life at sea.

It has been noted during many investigations after fires on board that because of lack of knowledge, training and experience, a small fire has turned into a disaster.

To overcome this, IMO through the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), jointly with the individual maritime nations, has tried to elevate seafarers training standards.
Furthermore, the Regional Academy of Maritime Science and Technology, Abidjan, the one and only institute of high level training for the West and Central African Francophone Region, has always tried to do its best, despite its limited means, to achieve the necessary training quality standards.

However, due to advanced technology in ship design, construction and operation on the one hand and the hazardous materials carried aboard ships on the other today's seafarers and shore-based maritime personnel have to be as well-trained as possible through advanced training and refresher courses in many special areas including fire prevention, control and extinguishing.
2. THE DEVELOPMENT OF MARITIME EDUCATION AND TRAINING IN THE WEST AFRICAN FRANCOPHONE REGION

The West African Francophone Region includes Mauritania, Senegal, Guinea, Cote d'Ivoire, Togo and Benin. There is no Maritime Education and Training Centre in Togo and Benin. Centres existing in Mauritania, Senegal and Guinea are for low level training, that is to say ratings and skippers on board fishing vessels. The only centre in the West African Francophone Region for high level training is located in Abidjan, Cote d'Ivoire.

2.1 Historical background of the Regional Academy of Maritime Science and Technology, Abidjan

Maritime education and training in Cote d'Ivoire originated in 1957 with the establishment of a maritime training centre under the auspices of the Maritime and Lagoon-Fisheries Service.

On 31 July, 1970 under Convention Nr. 12/LE/FONDS/CA/70 signed by the Governments of the Republic of Cote d'Ivoire, the Republic of Togo and the People's Republic of Benin, the school was regionalized and the regional centre "Centre Regional de l'Enseignement et de l'Apprentissage Maritime" (CREAM) was set up.
To meet the demand for training foreign-going officers and senior engineer officers, the "Ecole Superieure de Navigation" was established within "CREAM" in 1974.

With the development of trading by the emergent fleets of the African countries, existing training facilities were becoming inadequate for the increasing needs of qualified staff. Therefore, the Government of Cote d'Ivoire issued Act Nr. 75-941 on 26 December 1975, establishing the Regional Academy of Maritime Science and Technology (RAMST) in Abidjan.

In February 1976, the Ministerial Conference of West and Central African States on Maritime Transport (MINCONMAR) decided, through its Resolution Nr. 5, to regionalize the National Maritime Training Centre in Abidjan, in order to provide it with modern training for the maritime personnel of its French-speaking Member States. In adopting this resolution the Government of Cote d'Ivoire accepted to transform the "Groupe des Ecoles de la Marine Marchande" (GEMMA) into the Regional Academy of Maritime Science and Technology (ARSTM).

In addition, the establishment of Regional facilities would ensure harmonized training in accordance with International Standards thus allowing for the exchange of highly trained personnel from one country to another.
Accordingly, pursuant to the MINCONMAR (1) Resolution mentioned above, the Government of Côte d'Ivoire decided to construct modern facilities on a new site.

In 1977 the United Nations Development Programme (UNDP) requested the International Maritime Organization (IMO) to carry out the technical assistance for the projet with the collaboration of the United Nations Conference on Trade and Development (UNCTAD).

The first phase of construction was completed in 1983 and was financed by the host Government. The second phase was completed in 1987 and has also been financed by the host Government with a loan of $US 10 million from the African Development Bank. The third phase of additional construction started in 1988. The operation of the Academy is currently financed by the Government of Côte d'Ivoire and the Academy is administered by an Ivorian General Director(2).

(1) "Conférence Ministérielle des États de l'Afrique de l'Ouest et du Centre sur les Transports Maritimes".

(2) MINCONMAR publication.
On 18 June 1982 the National Assembly passed for Act Nr.82-653 authorizing the President of the Republic to ratify the Convention regionalizing the Regional Academy of Maritime Science and Technology.

The Academy opened on the new site of "Niangon-Lokoa" on 5 October 1987.

2.2 Facilities of the Regional Academy of Maritime Science and Technology, Abidjan

Located at "Niangon-Lokoa", about 17 kilometers West of Abidjan, the Regional Academy of Maritime Science and Technology occupies, at present, buildings on an excellent site overlooking the lagoon.

The buildings include the administration building, classrooms for the "Ecole Superieure de Navigation" (ESN), the "College d’Enseignement et d’Apprentissage Maritime" (CEAM) and the "Ecole Superieure des Transports Maritimes" (ESTM), conference rooms and lecture halls, laboratories, a planetarium, engineering workshops, seamanship and lifeboat area, cargo handling area, fire fighting section and maintenance area.

The laboratory building includes: electrical engineering, electronics, automation, computer science, radio, navigation instruments, English language, radar simulator, engine room simulator and navigation bridge.
Facilities of the Regional Academy of Maritime Science and Technology, Abidjan.
A 228 ton training ship fully equipped for navigation has been donated by the Japanese Government for training purposes.

The students' living area contains accommodation for 268 students, 2 restaurants, a clinic, a cafeteria and a rest area.

2.2.1 Present Courses

The Regional Academy of Maritime Science and Technology consists of three different schools:

- the "Ecole Superieure de Navigation"
- the "Ecole Superieure des Transports Maritimes"
- the "College d'Enseignement et d'Apprentissage Maritime".

1 "Ecole Superieure de Navigation" deals with the training of:

1.1 - Deck officers: level 1

Entrance examination: candidates carrying a Baccalaureate certificate, scientific option (C, D, E, F2, F3) (1); 4 years of theoretical study

(1) C (mathematics and physics), D (natural science), E (technical and industrial), F2 (electromechanical), F3 (chemical).
plus 48 months sea service, leading to the Certificate of Competency of Higher Maritime Studies Part 2 "Brevet d'Etudes Superieure Maritime 2eme Partie" (BESM 2) Deck (Master Certificate).

.1.2 - Engine officers: level 1

Entrance examination: ditto
4 years of theoretical study plus 48 months sea service, leading to the Certificate of Competency of Higher Maritime studies Part 2 (BESM 2) Engine (Chief engineer Certificate).

.1.3 - Port officers:

Entrance examination: candidates carrying a Baccalaureate certificate option (C, D); 2 years of theoretical study plus 6 months shipboard training, leading to the "Diplome d'Officier de Port."

.2 "Ecole Superieure des Transports Maritimes": deals with the training of:

- Shore-based maritime personnel.

Entrance examination: candidates carrying a Baccalaureate certificate option B, C, D, E, G2 (1)

(1) B (economics), G2 (management)
2 years of theoretical study plus 6 weeks vocational training, leading to the "Diplôme d'Études Générales Maritimes Spécialités Port/Manutention or Transit/Consignment/Armement."

.3 "Collège d'Enseignement et d'Apprentissage Maritime": deals with the training of:

.3.1 - Deck Subordinate officers:
level 2

Entrance examination: candidates having completed 11 years of general education or holding a "Certificat d'Aptitude Professionnel" or a "Brevet d'Enseignement Professionnel option mechanical". 3 years of theoretical study plus 46 months of sea service, leading to "Brevet d'Études Techniques Maritimes 2ème partie."

.3.2 - Engine Subordinate officers:
level 2: ditto

Leading to "Brevet d'Études Techniques Maritimes 2ème partie" Engine (1).

(1) "Académie Régionale des Sciences & Techniques de la Mer d'Abidjan"
The "College d'Enseignement et d'Apprentissage Maritime" also deals with the training of ratings and skippers on board fishing vessels.
CHAPTER III

3. THE NEED FOR FIRE FIGHTING TRAINING AND REFRESHER COURSES AT THE REGIONAL ACADEMY OF MARITIME SCIENCE AND TECHNOLOGY, ABIDJAN

3.1 STATISTICS OF SHIPS CASUALTIES WITH PARTICULAR EMPHASIS ON THOSE CAUSED BY FIRES (1)

It has been found impossible to formulate statistical tables which do not combine the two subjects of fire and explosion under a single heading.

So, from the statistical records of total losses due to fire and explosion recorded during the period of 1974 to 1984 shown in fig.1, there appears to be a cruel continuation of such incidents over many years.

In table I, "World total losses caused by fires and explosions" one can notice that over 11 years from 1960 to 1970 losses due to fire and explosion reached 35% in 1961 and 1969 and an average of 23% for the whole period.

(1) Ship Fires in The 1980s, Tuesday 3 and Wednesday 4 December 1985 at The Institute of Marine Engineers.
<table>
<thead>
<tr>
<th>Year</th>
<th>Loss</th>
<th>Fire loss/Total loss</th>
<th>0.1%</th>
<th>0.2%</th>
<th>0.3%</th>
<th>0.4%</th>
<th>0.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>0.099</td>
<td>0.34</td>
<td>29.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>0.060</td>
<td>0.31</td>
<td>19.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>0.097</td>
<td>0.32</td>
<td>29.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>0.140</td>
<td>0.31</td>
<td>45.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>0.100</td>
<td>0.35</td>
<td>28.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>0.174</td>
<td>0.56</td>
<td>31.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>0.195</td>
<td>0.43</td>
<td>44.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>0.163</td>
<td>0.39</td>
<td>41.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>0.161</td>
<td>0.35</td>
<td>46.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>0.154</td>
<td>0.33</td>
<td>47.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>0.094</td>
<td>0.32</td>
<td>30.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fires and explosions ——— All causes ———

FIG. 1: World total losses by fires and explosions and all causes

<table>
<thead>
<tr>
<th>Year</th>
<th>Loss (%)</th>
<th>Year</th>
<th>Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>12</td>
<td>1974</td>
<td>30</td>
</tr>
<tr>
<td>1961</td>
<td>35</td>
<td>1975</td>
<td>20</td>
</tr>
<tr>
<td>1962</td>
<td>12</td>
<td>1976</td>
<td>30</td>
</tr>
<tr>
<td>1963</td>
<td>17</td>
<td>1977</td>
<td>45</td>
</tr>
<tr>
<td>1964</td>
<td>23</td>
<td>1978</td>
<td>29</td>
</tr>
<tr>
<td>1965</td>
<td>21</td>
<td>1979</td>
<td>31</td>
</tr>
<tr>
<td>1966</td>
<td>30</td>
<td>1980</td>
<td>45</td>
</tr>
<tr>
<td>1967</td>
<td>25</td>
<td>1981</td>
<td>42</td>
</tr>
<tr>
<td>1968</td>
<td>23</td>
<td>1982</td>
<td>46</td>
</tr>
<tr>
<td>1969</td>
<td>35</td>
<td>1983</td>
<td>47</td>
</tr>
<tr>
<td>1970</td>
<td>25</td>
<td>1984</td>
<td>31</td>
</tr>
<tr>
<td>Average over 11 years</td>
<td>23</td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>
Over the 11-year period from 1974 to 1984 the losses caused by fires and explosions reached 45% in 1977 and 1980, 47% in 1983 and averaged 36% for the whole period.

Table II, "Reports of fires and explosions; total and partial losses", indicates a number of 402 casualties in 1974 which had steadily decreased to 260 by 1984 over the intervening years.

It also shows a reduction in the number of outbreaks of fire known to be due to welding, collision and oil residue for the period from 1974 to 1984. However, there has been a substantial increase in the number of fires in machinery spaces.

In Table III, "Total losses caused by fire and explosion relative to size", it appears that vessels below 6,000 gross tons show the highest number of losses.

Table IV, "Age of total losses posted as caused by fire or explosion; 500 gross tons and upwards", indicates that the greatest number of losses were recorded for vessels built between 1956 and 1965.

Table V and VI, "World total losses; 500 gross tons and upwards", provide further direct comparisons for the two periods 1960-1970 and also record the large increase in the gross tonnage lost during recent years.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World gross tonnage (in millions)</td>
<td>303.9</td>
<td>334.4</td>
<td>364.0</td>
<td>385.5</td>
<td>397.7</td>
<td>404.3</td>
<td>410.8</td>
<td>411.6</td>
<td>415.3</td>
<td>413.0</td>
<td>409.2</td>
</tr>
<tr>
<td>Total losses due to fire or explosives</td>
<td>54</td>
<td>48</td>
<td>57</td>
<td>65</td>
<td>71</td>
<td>63</td>
<td>56</td>
<td>69</td>
<td>72</td>
<td>66</td>
<td>56</td>
</tr>
<tr>
<td>Gross tonnage</td>
<td>302 677</td>
<td>202 673</td>
<td>356 160</td>
<td>541 858</td>
<td>398 939</td>
<td>704 632</td>
<td>401 446</td>
<td>673 717</td>
<td>672 310</td>
<td>637 340</td>
<td>596 855</td>
</tr>
<tr>
<td>Outbreaks discovered at sea</td>
<td>166</td>
<td>132</td>
<td>132</td>
<td>148</td>
<td>140</td>
<td>139</td>
<td>130</td>
<td>144</td>
<td>162</td>
<td>124</td>
<td>127</td>
</tr>
<tr>
<td>Outbreaks discovered in port:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) under repair</td>
<td>16</td>
<td>18</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>24</td>
<td>22</td>
<td>22</td>
<td>15</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>(ii) not under repair</td>
<td>220</td>
<td>216</td>
<td>205</td>
<td>198</td>
<td>191</td>
<td>180</td>
<td>182</td>
<td>188</td>
<td>152</td>
<td>132</td>
<td>110</td>
</tr>
<tr>
<td>Outbreaks total</td>
<td>402</td>
<td>366</td>
<td>249</td>
<td>360</td>
<td>347</td>
<td>343</td>
<td>314</td>
<td>254</td>
<td>239</td>
<td>286</td>
<td>260</td>
</tr>
<tr>
<td>Outbreaks welding</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Outbreaks collision</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>—</td>
<td>15</td>
<td>6</td>
<td>—</td>
<td>1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Outbreaks due to oil residue</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>—</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>Total outbreaks</td>
<td>402</td>
<td>366</td>
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*Trans IMarE (C), Vol. 98, Paper CII*
### Table III: Total losses caused by fire and explosion relative to size

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-12b-
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*Trans IMarE (C), Vol. 98, Paper C111*
In view of these statistics one can conclude, regarding Table IV, that there was a very large number of vessels built between 1956 and 1965 and maybe the material of construction at that time was a significant factor in the casualty rate.

But, generally speaking, in spite of the extensive advances made in ship design, materials, safety equipment and procedures, one can notice that total loss records due to fire and explosion are still very high.

Table VII, "summary of lives lost by year and category of casualty" shows that from the statistical point of view, the total of 67 lives lost in 1988 was the highest for the last 8 years. Of these, 29 were lost when a ship sustained a fire and explosion and broke in two, 27 were lost when a ship broke in two and caught fire and 6 were lost due to a fire and explosion when the ship was under repair.
### TABLE VII

#### SUPPLEMENTARY ANALYSES RELATED TO SERIOUS CASUALTIES TO OIL/CHEMICAL TANKERS, COMBINATION CARRIERS AND GAS CARRIERS, 1974 - 1988

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<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>5</td>
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<td>5</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>1987</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>18</td>
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<tr>
<td>1988</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>4</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>67</td>
</tr>
<tr>
<td>TOTAL</td>
<td>89</td>
<td>10</td>
<td>7</td>
<td>149</td>
<td>480</td>
<td>185</td>
<td>20</td>
<td>183</td>
<td>74</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>1,209</td>
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</table>
Of the total of 1,029 lives lost, 629 were due to fires and explosions. Of these, 167 were lost due to fire and explosion on ships under repair, including 83 in a single casualty in 1976.

In Table VIII, in comparison with oil/chemical tankers, combination carriers and gas carriers, it appears that over the 15-year period, the casualty rates for cargo and other fire and explosion accidents in combination carriers are considerably higher than for oil/chemical tankers and gas carriers (1).

(1) Casualty Statistics
International Maritime Organization (IMO)
Maritime Safety Committee 56th session
Agenda item 15.1
<table>
<thead>
<tr>
<th>TABLE VIII</th>
<th>OIL &amp; CHEMICAL TANKERS AT RISK</th>
<th>CARGO</th>
<th>MCHV</th>
<th>PMP</th>
<th>OTHER</th>
<th>MG</th>
<th>HD</th>
<th>MD</th>
<th>OTHER</th>
<th>TOTAL</th>
<th>RATE</th>
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<tbody>
<tr>
<td>8,000 - 14,999 (10,000 - 24,999 DWT)</td>
<td>11,379</td>
<td>5</td>
<td>42</td>
<td>17</td>
<td>39</td>
<td>16</td>
<td>42</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>16</td>
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<tr>
<td>15,000 - 29,999 (25,000 - 44,999 DWT)</td>
<td>14,382</td>
<td>6</td>
<td>78</td>
<td>33</td>
<td>54</td>
<td>25</td>
<td>32</td>
<td>4</td>
<td>9</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>30,000 - 79,999 (45,000 - 149,999 DWT)</td>
<td>12,843</td>
<td>1</td>
<td>87</td>
<td>31</td>
<td>54</td>
<td>31</td>
<td>43</td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>66</td>
</tr>
<tr>
<td>80,000 &amp; + (150,000 DWT &amp; +)</td>
<td>7,797</td>
<td>1</td>
<td>24</td>
<td>6</td>
<td>14</td>
<td>16</td>
<td>13</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>TOTALS</td>
<td>48,381</td>
<td>13</td>
<td>211</td>
<td>69</td>
<td>161</td>
<td>69</td>
<td>130</td>
<td>11</td>
<td>38</td>
<td>2</td>
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<table>
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<tr>
<th>COMBINATION CARRIERS AT RISK</th>
<th>CARGO</th>
<th>MCHV</th>
<th>PMP</th>
<th>OTHER</th>
<th>MG</th>
<th>HD</th>
<th>MD</th>
<th>OTHER</th>
<th>TOTAL</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,000 - 14,999 (10,000 - 24,999 DWT)</td>
<td>110</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
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</tr>
<tr>
<td>15,000 - 29,999 (25,000 - 44,999 DWT)</td>
<td>377</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
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</tr>
<tr>
<td>30,000 - 79,999 (45,000 - 149,999 DWT)</td>
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<td>10</td>
<td>3</td>
<td>7</td>
<td>16</td>
<td>9</td>
<td>0</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>80,000 &amp; + (150,000 DWT &amp; +)</td>
<td>1,213</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
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<tr>
<td>TOTALS</td>
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<td>0</td>
<td>11</td>
<td>8</td>
<td>10</td>
<td>19</td>
<td>14</td>
<td>0</td>
<td>10</td>
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<table>
<thead>
<tr>
<th>GAS CARRIERS AT RISK</th>
<th>CARGO</th>
<th>MCHV</th>
<th>PMP</th>
<th>OTHER</th>
<th>MG</th>
<th>HD</th>
<th>MD</th>
<th>OTHER</th>
<th>TOTAL</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,000 - 14,999 (10,000 - 24,999 DWT)</td>
<td>852</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>15,000 - 29,999 (25,000 - 44,999 DWT)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>30,000 - 79,999 (45,000 - 149,999 DWT)</td>
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<td>0</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>80,000 &amp; + (150,000 DWT &amp; +)</td>
<td>211</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

RATE % | 0.00 | 0.35 | 0.08 | 0.23 | 0.04 | 0.08 | 0.00 | 0.04 | 0.00 | 0.08 | 0.31 | 0.00 | 1.19
3.2 CASE STUDIES


On Tuesday, February 27, 1979 at about 0800 ship's time the Liberian registered combination carrier (OBO) "SAINT CHRIS" of 38,513 gross registered tons suffered an explosion followed by a fire during a ballast passage from Philadelphia to Curacao, Netherlands Antilles. The accident occurred during the gasfreeing operation, when cargo tanks 10, 11, 9, 8, and 7 exploded.

After the explosion and the fire, the members of the crew, except the master, the Radio Officer, the second assistant engineer and the owners' port Captain, who happened to be aboard, were evacuated by the U.S Coast Guard cutter "TALLULAH" and landed at Atlantic Beach. One crewman was missing and presumed to be dead (1).

(1) Decision of the Commissioner of Maritime Affairs, Republic of Liberia and Report of the Preliminary Investigation into the Explosion and Loss of Life in OBO "SAINT CHRIS" (O.N. 6173). Published by the Bureau of Maritime Affairs by Authority of the Minister of Finance.
Damage to the vessel was considerable. She was towed by a commercial salvor to Jacksonville, Florida and declared by the owners to be a constructive total loss.

In the light of the testimony adduced during the investigation, the Investigating Officer found that:

.1 The vessel was not operated in accordance with the owners' instructions, the International Chamber of Shipping's recommendations or those of the International Conference on Tanker Safety regarding dirty ballast in OBO carriers and the explosion was a result of failure.

.2 The actions and attitudes of most licensed and unlicensed members of the ship reflected hysteria, a lack of discipline and motivation.

.3 The crew was not adequately trained to cope with an emergency situation.

3.2.2 FIRE ON BOARD THE ITALIAN PASSENGER SHIP "ANGELINA LAURO" IN CHARLOTTE AMALIE HARBOR, ST. THOMAS, U.S VIRGIN ISLANDS: MARCH 30, 1979

On the afternoon of March 30, 1979, a fire erupted in the crew galley on board the Italian Passenger ship "ANGELINA LAURO" while it was berthed starboard side to the West India Company
dock, Charlotte Amalie Harbor, St. Thomas, U.S. Virgin Islands. The fire quickly spread from the crew galley to a dining room. The fire was fought by the ship’s crew and shoreside fire fighters.

Heavy smoke impeded fire fighting efforts aboard the ship and eventually forced the crew to leave the ship. Fire fighting efforts continued to be directed against the exterior of the vessel, but the fire raged out of control throughout the interior spaces until the fire burned itself out 4 days later.

The "ANGELINA LAURO" was almost destroyed. Two persons received minor injuries.

The U.S. National Transportation Safety Board determined that the probable cause of the initial fire aboard the "ANGELINA LAURO" was overheated oil in an unattended skillet in the crew galley. This initial fire propagated and spread throughout the ship and resulted in the ship’s destruction because of:

.1 The failure of responsible vessel personnel to promptly establish effective control and coordination of the shipboard fire fighting effort;

.2 The failure of the ship’s fire detection and sprinkler system to provide early warning and to extinguish the fire;
3 The extensive use of combustible materials in the ship's internal construction which provided fuel for the fire and aided the generation and spread of smoke which hampered fire fighting efforts;

4 A lack of training of the ship's officers and crew to fight the type of fire which developed on the "ANGELINA LAURO" (1).

3.2.3 FIRE ON BOARD THE CYPRIO T BULK CARRIER "PROTECTOR ALPHA" COLUMBIA RIVER, NEAR KALAMA, WASHINGTON, FEBRUARY 14, 1982.

Shortly before 2000 on February 14, 1982, a fire erupted in the engine room of the Cypriot bulk carrier "PROTECTOR ALPHA" while it was moored to the dock in the Columbia River at the North Pacific Grain Growers Association grain elevators near Kalama, Washington.

(1) Marine Accident Report
U.S. National Transportation Safety Board
Washington, D.C. 20594 U.S. Government
Fire on board the Italian passenger ship "ANGELINA LAURO" NTSB- MAR- 80- 16.
As a result of the accident, three crew members were injured. Three persons who were not crew members but who were involved in fire fighting operations, were also injured. The "PROTECTOR ALPHA" engine-room and the entire deckhouse, which included the pilothouse, were completely destroyed.

The damage has been estimated at $15 million.

The U.S. National Transportation Safety Board determined that the probable cause of this accident was the failure of the Chief Engineer to monitor and control properly the fueling of the vessel which resulted in the overfilling of a diesel oil tank and the ignition of the oil when it contacted the hot surface of the exhaust manifold of a nearby operating diesel engine (1).

According to the findings referring to the incident it appeared, i.a., that there was an insufficient number of self-contained breathing apparatus required aboard the "PROTECTOR ALPHA" for use by the number of persons needed to enter the smoke-filled engine-room to fight the fire.

(1) Marine Accident Report
U.S National Transportation Safety Board
Washington, D.C. 20594
Fire on board the Cypriot Bulk Carrier "PROTECTOR ALPHA", NTSB- MAR- 63-1
3.2.4 FIRE ON BOARD THE "SCANDINAVIAN STAR" APRIL 7, 1990

The Bahamian roll-on-roll-off motor ferry "SCANDINAVIAN STAR" (10,513 gross tons), caught fire Lat 58°34N, Long 10°34E, with heavy loss of life, and was towed to Lysekil in Sweden still on fire.

The blaze on the Da-No Line operated vessel, which started in the early hours of Saturday 7 April 1990 while the vessel was travelling between Oslo in Norway and the Danish port of Fredrikshavn, was finally extinguished late on Sunday.

A total of 493 passengers and crew are believed to have been on the ferry when the fire started, and more than 150 people lost their lives.

The "SCANDINAVIAN STAR" inquiry has, i.a., highlighted the lack of on board training and the language problems between crew members that occurred during the fire.

In view of this particular fire tragedy, the International Maritime Organization (IMO) has been studying relevant ship safety regulations (1).

(1) LLOYD's LIST
    Monday April 9, 1990
New international fire safety regulations for passenger ships, including compulsory periodic on board training and drills, could eventually be introduced following pressure from the United States.
3.3 NEED FOR TRAINING IN FIRE FIGHTING

Although world gross tonnage increases with the advent of larger vessels, one can notice that the number of ships has been reduced. There are two reasons for this: first, today’s ships are bigger and faster, they can carry more cargo and lay times in ports have been shortened; second, there have been many marine accidents, having as a consequence loss of human life, loss of property and productivity.

Among marine casualties, fire on board is one of the major hazards. Its causes are various.

There are quite a number of different ways in which fire can break out on board a vessel. Particular cargoes loaded on board dry cargo vessels have their own hazards which may be exacerbated by poor ventilation. Certain methane releasing coals fall into this category. Tankers, by the nature of what they are carrying, are particularly vulnerable to fire and the greatest hazards tend to arise not when the tanks are full of oil but when they are empty or almost empty and full of a highly inflammable mixture of oil vapor and air. For this reason stringent safety precautions are prescribed both during and after discharge.

Engine-room fires can arise out of a variety of occurrences; electrical short circuits, flashbacks from boilers, oil spontaneously igniting upon
contact with excessive temperatures such as can be found on superheated steam pipes and diesel exhausts, to name but a few (1).

In shipping fires and explosion on board which represent about 40% of marine casualties, entail more deaths than strandings, collisions, or other disasters.

Compared to persons ashore who have available the immediate assistance of well-trained fire fighting professionals, mariners are alone aboard ship. So when a fire occurs at sea, assistance is far away and the crew must cope with the problem.

These efforts, often because of lack of knowledge, training, and experience, have often produced less than satisfactory results and at times have resulted in tragedy.

As a result of more advanced technology being employed on ships these days, mariners must acquire more knowledge in many special areas including fire prevention, control, and extinguishing.

(1) Special Report
Fire at Sea: Accident or Arson
International Maritime Bureau
However, in spite of changes effected and regulations promulgated over the years by Government agencies and maritime administrations that have greatly reduced the ever-present danger of fire aboard vessels, fire tragedies have continued to occur.

Therefore, it must be the seafarer's responsibility to be as well-trained as possible and to understand the causes of fire through pre-sea courses, advanced training and refresher courses so as best to prevent them, and eventually to extinguish a fire if it occurs.

Also, the International Maritime Organization (IMO) has been and is working in order to save life at sea and to improve the safety of international shipping by adopting conventions, codes, recommendations and other legal instruments.

One of the most important conventions of IMO since its inception in 1959 is the International Convention for Safety of Life at Sea (SOLAS).

It was the 1948 SOLAS convention which introduced the International Passenger Ship Safety Certificate which, i.a., dealt with requirements for structural fire protection, fire detection and extinction, and the Cargo Ship Equipment Certificate for cargo ships of 500 gross tons and above which, i.a., dealt
with extinguishing arrangements. The SOLAS 1960 Convention introduced the cargo ship safety construction certificate which, i.a., includes requirements for structural fire protection.

Casualties to passenger ships through fire in the early 1960s emphasized the need to improve the fire protection provision of the 1960 Convention, and in 1966 and 1967, amendments which particularly detailed fire safety provisions for tankers and combination carriers were adopted by the IMO Assembly.

However, in spite of the high safety standards in the ships built, fire accidents still occurred. So, IMO and the maritime nations have tried and are trying to elevate the seafarers standards through training.

As a result, at the conference convened by IMO on this subject in 1978, the International Convention on Standard of Training, Certification and Watchkeeping for Seafarers (STCW) was adopted. Its major aims are to establish:

1. Global minimum standards of competence of seafarers (officers and key ratings).

2. Global harmonization of standards of training and examination of seafarers.

3. Global acceptance of certificates granted
under the Convention.

.4 Globally safe and efficient manning of ships.

As far as fire safety on board is concerned, the convention states that every candidate should have adequate experience or have undergone appropriate training in the field of fire prevention and fire fighting equipment, including:

.1 the ability to organize fire drills,

.2 the knowledge of classes and chemistry of fire,

.3 attendance at an approved fire fighting course.

In addition to this, ratings forming part of a navigational watch on a sea-going vessel should be familiar with the basic principles of fire fighting. Therefore the fire fighting courses enable the trainee to appreciate the danger of fire aboard ships, to know the main causes of fires, the measures to be taken to prevent them and the means to fight such fire (1).

(1) International Maritime Organization (IMO)
These courses are part of IMO short courses delivered at the maritime academies of the countries which have ratified the STCW Convention. There are necessary since training of seafarers is the most effective way to decrease the number of incidents due to fire on board and to increase safety.
In order to ensure safety on board Ivorian merchant ships and safety in the ports, and also to meet the STCW requirement which states that all personnel should attend an approved basic or advanced practical fire fighting course relevant to their duties and responsibilities, the training of merchant marine officers and shore-based personnel has been carried out by the Regional Academy of Maritime Science and Technology at Abidjan since its establishment.

However, up to 1987 the training suffered from a lack of facilities and equipment. The practical fire fighting training with the fire brigade for each class to practice some fire extinction during an academic year was available for only one afternoon.

To compensate for this short-coming, "SITRAM", our national maritime navigation company has sent, since 1979, ships’ officers for one week practice to the "Bataillon de Marins Pompiers" at Marseilles, France. A total of 270 seafarers have been trained there.
However, this training has been cancelled because of the costs involved. Unfortunately not all seafarers have had a chance to attend it. The daily instruction cost in Marseilles equals 1,500 French Francs (FF) per trainee. The training lasted five days and thus cost the company 7,500 FF (not including transport, accommodation, and food). Instead, for the same duration at the Regional Academy of Maritime Science and Technology, the training costs 1,500 FF per trainee, that is to say 300 FF per day.

Therefore the national shipping company "SITRAM" is saving not only 6,000 FF, which is the difference between 7,500 FF and 1,500 FF representing five days training cost per trainee, but also a considerable amount of money for transport, accommodation and food.

Moreover, despite the fire drills which take place regularly on board merchant ships at sea as well as in the ports, one can notice that after a few years at sea, the seafarers lose part of their previous knowledge and skills.

As a result, seafarers and shore-based marine personnel need some refresher courses in order to overcome this handicap.

In view of the above, even though the fire fighting training course is delivered to the cadets, it is necessary for the former students
working at present as officers on board Ivorian ships or in the port areas to take advantage of the new facilities at the "RAMSTA" which, among other things, include fire fighting facilities.
3.5 WHICH SEAFARERS AND SHORE BASED MARITIME PERSONNEL ARE TO ATTEND SUCH TRAINING?

The fire fighting training concerns the candidates for deck and engine officers' certificates and seamen currently pursuing their training at the Maritime Academy, as required by the "STCW" convention.

However, in 1986, the RAMST was made a Branch of the World Maritime University for the running of specialized short courses developed by IMO with the financial assistance from Norway.

Fire fighting is among these courses. By using the basic information of IMO short courses jointly with the information acquired during studies as a WMU student, I would like to suggest three main fire fighting courses.

.1 Basic fire fighting course designed for first year cadets, first year port officers trainees, deck and engine ratings;

.2 Intermediate fire fighting upgrading course designed for 2nd and 3rd year cadets and 2nd year port officers trainees;

.3 Advanced fire fighting upgrading course for 4th year students (mates and engineers);
The two courses namely: basic fire fighting course and advanced fire fighting upgrading course will be used also as refresher courses. They should enable the trainees not only to renew their fire fighting certificates, but also they should provide them with the acquisition of new knowledge and skills, and as a result improve the safety standards and efficiency on the job.
3.6 OBJECTIVES OF COURSES:

If the principal objective of the fire fighting courses is to provide a thorough training for every seafarer and particularly for officers aboard ships as required by the STCW Convention, two other kinds of objectives are to be seen at the RAMST fire fighting training and refresher courses.

First, the objectives if met would be of benefit for both the trainees and the Academy.

Regarding the basic fire fighting course designed for first year cadets, first year port officers trainees and ratings, the main objective is to provide them with a comprehensive basic knowledge of fire prevention, detection and fighting and enough information that will allow them to realize the dangers caused by fires on board ships, to prevent and detect them and to handle the adequate fire fighting equipment in case of need.

As regards the intermediate fire fighting upgrading course designed for 2nd and 3rd year cadets and 2nd year port officers trainees who are supposed to be better educated, they must be capable of understanding and learning the theoretical and technical aspects of fire fighting and fire safety such as ship construction, fire chemistry and fire prevention.
This course will give essential principles to the trainees so that they should have no difficulty in applying them to any kind of fire.

Concerning the advanced fire fighting upgrading course for 4th year students, it will provide the trainees with additional theoretical and practical background in fire fighting in order to help them to organise and direct fire operations and to be able to train the personnel aboard their ships.

In addition this fire fighting training would enable my Academy not only to design a new course structure but also to expand its regular programme.

CONCLUSION:

My aim in establishing these courses at the Regional Academy of Maritime Science and Technology, Abidjan, is to allow the Government to spend less money on training seafarers abroad.

Due to the advanced technology being employed on ships these days, seafarers on board are called upon to assume more responsible roles. As a result, again, this calls for extra training, i.e refresher courses.
CHAPTER IV

4. REQUIREMENTS FOR THE IMPLEMENTATION OF BASIC FIRE FIGHTING TRAINING AND REFRESHER COURSES, INTERMEDIATE AND ADVANCED UPGRADE COURSES AND ADVANCED REFRESHER COURSES AT THE REGIONAL ACADEMY OF MARITIME SCIENCE AND TECHNOLOGY, ABIDJAN

As already emphasized in the previous chapter, the shipping industry has become advanced. Therefore, it is necessary to train the personnel involved in the various subjects related to the maritime field which, among other things, include fire fighting.

Nowadays if a highly competent personnel is needed to man the sea-going vessels on the one hand, it is obvious that properly qualified instructors are required to train the personnel on the other. As a result, the entry qualifications of a maritime academy must be high.

In Professor Günther Zade's paper entitled "The Training of Merchant Marine officers; what challenges have been and have to be met" (1),

(1) Professor Günther Zade, "The Training of Merchant Marine officers; what challenges have been and have to be met?" presented at Conference "1993, an opportunity for the French navy officers", at Ecole Nationale de la Marine Marchande, Le Havre, France, 16-17 February 1989, P.9.
it is correctly stated that "Higher standards are not only the result of an extended and better training and the use of advanced training equipment but also of higher entrance requirements for maritime studies" (1).

Besides, running a fire fighting course smoothly and to make it effective, great attention must be paid to the availability and use of:
- properly qualified trainers;
- support staff;
- rooms and other space;
- equipment.

(1) Professor Günther Zade, "The Training of Merchant Marine officers; what challenges have been and have to be met?" presented at Conference "1993, an opportunity for the French navy officer", at Ecole Nationale de la Marine Marchande, Le Havre, France, 16-17 February 1989, P.9.
4.1 TRAINING FACILITIES (AND EQUIPMENT) IN THE REGIONAL ACADEMY OF MARITIME SCIENCE AND TECHNOLOGY, ABIDJAN

The fire fighting training facilities and equipment of the "RAMST" are located within the institute.

They are as follows:
An ordinary classroom which enables the instructors to carry out the theoretical training by using a blackboard and audiovisual materials such as video films.

Practical training takes place in an up-to-date building for smoke and fire drills situated near the lagoon and at a reasonable distance from the Institute itself. It is also located far away from habitation to prevent smoke nuisance for the inhabitants.

However, we cannot talk about fire simulation without talking about pollution of the environment.

However, since such practical training does not occur every week of the academic year, then the possibility of pollution is minimal and can be forgotten.

In addition there are the following:

- 1 facility for recharging compressed-air cylinders;
Fire fighting training area

Fire drill in the fire fighting training area
- 1 storeroom for safety equipment;

- 1 mobile fire motor-pump of about 40 m³/h under 8 bars drawing from the lagoon;

- 1 electrical fixed fire pump serving at least 4 equipped fire hydrants;

- 1 hydraulic circuit for training purposes with reprocessing, settling and oil refining in the pump-room;

- 1 mobile apparatus for high-expansion foam generator;

- 1 portable mixer for low-expansion foam generator;

- 5 portable carbon dioxide (CO₂) extinguishers;

- 8 portable water diffuser extinguishers;

- 4 portable dry powder extinguishers;

- 1 portable Halon-1211 extinguisher;

- 2 portable foam extinguishers;

- 15 sets of fireman’s outfits;

- 5 safety lines with snaphooks

- 1 fixed CO₂ extinction
-4 self-contained demand-type breathing apparatuses (SCBA), checked once a year by specialists;

-1 compressor for refilling breathing apparatus cylinders;

-4 communications apparatus (walkie-talkie);

-1 fire detector and fire alarm system for gases, carbon monoxide, combustible gases;

-2 portable gas detectors with cartridges (oxygen, carbon monoxide, combustible gases...)

-3 video films concerning fire equipment and fire fighting are available at the "RAMST".

Thanks to these facilities and equipment, the trainees have the opportunity to simulate ship deck fire in an open field area allocated for the purpose. A simulation of engine room, accommodation, cargo holds, and bridge fire is conducted in the installations having a ship configuration.

However, the safety department has at its disposal only 4 breathing apparatuses used for demonstration in the classroom and not during the fire drills because, there are insufficient. Thus it can be stated that the fire fighting department is run with inadequate equipment.
When thinking about the trainees who fight the fire during the fire drills without breathing apparatuses, one can be aware of the risks taken by the instructors and by the "RAMST" itself. This is a health hazard not only for the trainees but also for the instructors themselves who have continuous contact with an atmosphere contaminated by smoke and toxic gases.

Once again this is not adequate, and the efficiency required cannot be achieved by such obsolete methods. This is why efforts by the Regional Academy of Maritime Science and Technology should be made in order to run the fire fighting training safely.

The financial resources of the "RAMST" are limited because of the fact that it is not regionalized yet. If, however, it is eventually regionalized and its members undertake to fulfill their obligations by paying their contributions promptly, this will improve the "RAMST's" financial standing.

However, in the meanwhile I would suggest that as a matter of urgency the following equipment should be acquired in order to establish the necessary prerequisites for the improvement of the training.

-10 self-contained, demand-type breathing apparatuses;
-15 pairs of anti-fire gloves;
-15 goggles;
-15 pairs of boots;
-15 helmets (in cotton);
-15 fire protective clothings;
-5 fire hoses (70 mm diameter);
-5 fire hoses (45 mm diameter);
-1 breathing apparatus "Fenzy";

The cost of this equipment, compared to human lives, is nothing.

Also overhead projectors, which are commonly used nowadays as teaching and training aids, do not exist in the "RAMST's" safety department. Therefore, I suggest the acquisition of at least two overhead projectors for the clear presentation and illustration of certain subjects.

In view of the real financial difficulties of "RAMST", I suggest that help should be solicited from international organizations like IMO and UNDP to provide the institution with the necessary equipment.
4.2 INSTRUCTORS

To get highly qualified instructors and teaching staff in the maritime field is one of the major problems faced by any developing country. So, in order to overcome this, the maritime personnel are asked to go abroad, particularly to the developed countries, for advanced training through fellowships from international organizations like UNDP/IMO.

Among the training institutions, the World Maritime University plays the most important role for developing countries by providing them with the most modern and up-to-date facilities for the training of high level senior personnel in all areas of shipping and related maritime activity.

There are specialized centres of a good level in some, mainly developed countries which train seafarers in specialized subjects such as fire fighting.

For this purpose the "Bataillon de Marins Pompiers" at Marseilles is one of these centres where Ivorian seafarers and instructors are highly trained in safety courses.

In order to run the Academy safety courses, two former ship officers, one of them from the navy and the second from the merchant marine, have been trained at this centre.
Thanks to their theoretical knowledge and sufficient practical experience, they get by, as one can, in training the cadets of the Academy with a theoretical and practical fire fighting course.

Nevertheless since the fire brigades within the city are well trained personnel, I suggest close contact between Abidjan Academy instructors and the fire department. They may be able to provide advice and assistance regarding the training of the cadets.
4.3 TRAINEES

As already mentioned, the proposed fire fighting courses will be delivered to the cadets during their studies in the academy, whereas the refresher courses will concern the navigators on board the national ships as well as ports officers.

4.3.1 TARGET POPULATION FOR BASIC FIRE FIGHTING COURSES

During the 1987-1988 Academic year there were 169 students from nine different countries divided as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>COTE D'Ivoire</td>
<td>124</td>
</tr>
<tr>
<td>TOGO</td>
<td>20</td>
</tr>
<tr>
<td>CAMEROON</td>
<td>12</td>
</tr>
<tr>
<td>GABON</td>
<td>5</td>
</tr>
<tr>
<td>ZAIRE</td>
<td>2</td>
</tr>
<tr>
<td>SENEGAL</td>
<td>2</td>
</tr>
<tr>
<td>GUINEA</td>
<td>2</td>
</tr>
<tr>
<td>COMOROS Islands</td>
<td>1</td>
</tr>
<tr>
<td>FRANCE</td>
<td>1</td>
</tr>
</tbody>
</table>
The academic year 1988-1989 started the first week of October 1988. The total student population in the "RAMST" at that time was about 120 students.

The total population for the academic year 1989-1990 is 95 students.

From these figures we can note a tendency for a decrease in the number of students due to the financial problems encountered by shipping companies during the last 10 years.

As a result, a certain number of ships have been sold and seafarers have been made redundant.

However, in spite of this decrease, an average of 100 cadets could be trained each year in fire fighting course.

4.3.2 TARGET POPULATION FOR INTERMEDIATE FIRE FIGHTING TRAINING COURSE

The percentage of failure during the four years of theoretical studies at the RAMST is about 5%. Therefore 95 students out of 100 from the basic fire fighting training course will attend the intermediate fire fighting course.
4.3.3 TARGET POPULATION FOR ADVANCED FIRE FIGHTING COURSE

In view of the above mentioned about 95 students will participate in this course.

4.3.4 TARGET POPULATION FOR BASIC AND ADVANCED FIRE FIGHTING REFRESHER COURSES

Regarding the national shipping company "SITRAM" the total population is at present 318 sea-going personnel divided as follows:

- Ships Officers: 101
- Ratings: 217
- Shore based maritime personnel:
  - Port Officers: 13
  - Subalterns: 25

From this target population planning could be made to train the sea-going personnel on leave and the shore based maritime personnel, in fire fighting refresher courses and at the same time to renew their certificates the validity of which will be five years.
I would therefore suggest that all sea-going
personnel having a sea time of five years must attend these courses because, from experience after this sea period, navigators lose their fire fighting skills.

These refresher courses will enable them to acquire new knowledge, new qualities and abilities.

Travemünde "Seemannsschule" Safety Centre in FRG is a good example in this field. There, a week long safety course is attended by experienced seafarers of different professions and ranks. This course aims at renewing their certificate for another 10-year period. This is really a good way to update the seafarers. However, the period of 10 years seems to me a very long time. This is why, according to my opinion, an intermediate period, i.e. five years, should be reasonable for fire fighting updating courses in accordance with the new technological developments.

In order to conduct the course smoothly and efficiently, I would suggest a maximum of 12 participants per course under the supervision of the two fire fighting instructors lecturing also in safety and shiphandling subjects.

In view of the target population mentioned earlier, the number of courses I would suggest to
offer per annum in each category are as follows:

- **Basic fire fighting course:**
  On the basis of 95 participants with 12 students at a time, eight courses can be delivered per annum.

- **Intermediate fire fighting upgrading course:**
  Since the course deals with 2nd and 3rd year cadets and 2nd year port officer trainees then about 85 students can participate. As a result seven courses can be offered per annum.

- **Advanced fire fighting upgrading course:**
  Usually there are about 20 students in 4th year class. Therefore two fire fighting courses can be offered per annum.

- **Basic fire fighting refresher course:**
  Taking into consideration their leave, 48 ratings out of 217 can attend this course. Therefore four courses can be offered per annum.

- **Advanced fire fighting refresher course:**
  36 ships officers and port officers out of 139 can also be available each year to participate in the course. That means three courses can be offered per annum.
4.4 DURATION AND CONTENTS OF PRESENT FIRE FIGHTING COURSES AT THE REGIONAL ACADEMY OF MARITIME SCIENCE AND TECHNOLOGY, ABIDJAN

Each student attends a fire fighting course during his studies at the "RAMST."

**Duration:** 4 sessions of 4 hours each, that is to say 16 hours.

**Day 1:** Theoretical (See graph on page 60)

- Presentation of 2 pedagogical video films referring to fire aboard ships;

- Conference on the general point of fire such as:
  - Risks of fires;
  - Causes;
  - Prevention;
  - Detection;
  - Extinguishment;
  - Types of fires;
  - Propagation of fire;
- danger of fire for the shipboard personnel;
- fire fighting equipment;

**Day 2: Practical (See graph on page 80)**

- dressing of fireman's outfit;
- demonstration in the use of fire hoses in the open field area;
- extinguishing a fire, using a fire hose
- extinguishing a fire, using the main types of extinguishers:
  - water
  - foam
  - powder
  - carbon dioxide (CO₂)
- demonstration in the use of a breathing apparatus;

**Day 3 and Day 4: Practical (See graph on page 80)**

- dressing of fireman's outfit;
training in the wearing of a breathing apparatus;

demonstration on the dummy for resuscitation purposes;

extinction of a big hydrocarbon fire (20m²) by using water then foam;

fire fighting in a closed area (building):
- class A fire in the 1st premise
- class B fire in the 2nd premise

In view of this training which I believe is not well-detailed, I would like to suggest the following training in keeping with the equipment existing on board "SITRAM" ships:

.1 Three-day basic fire fighting training and refresher courses;

.2 Four-day intermediate fire fighting upgrading course;

.3 Five-day advanced fire fighting upgrading and refresher courses.
4.5 DURATION AND CONTENTS OF PROPOSED FIRE FIGHTING COURSES AT "RAMST"

4.5.1 THREE-DAY BASIC FIRE PREVENTION AND FIRE FIGHTING COURSES FOR FIRST YEAR CADETS, FIRST YEAR PORT OFFICER TRAINEES, DECK AND ENGINE RATINGS

Since the deck and engine ratings do not have sufficient background in chemistry (admittance level is secondary school), then the course will deal mainly with the practical aspects. On completion of this course, the trainee must be able to know how fire can develop so that he can react in a correct manner in the event of an outbreak of fire by using the fire appliances correctly.

DAY 1 (See graph on page 80)

Theoretical

1. Introduction, safety and its principles

Duration: 00.30

This lecture aims at introducing the trainees to safety and its principles including an overview of statistics regarding ship casualties and their consequences.
The content of this session will consist of:

1.1 the list of the main aims of annex 1 resolution A.437 (XII) including:

- instructing all seafarers in the dangers of fire on board ships and the ways in which fires are caused.

- training seafarers, preferably before they take up employment on a sea-going ship, in the prevention and extinguishing of fires.

2 Theory of fire

Duration: 01.00

This session will cope with fire chemistry and the basic principles of physics relating to fire including the three elements of fire and explosion (fire triangle);

2.1 conditions for fire

this part will aim at:

2.1.1 listing conditions required for fire to occur including:

- the presence of materials which act as a fuel
- a source of ignition, e.g. chemical, biological
- the presence of oxygen
2.1.2 explaining how these conditions can be represented as a triangle (the fire triangle);

2.1.3 explaining how the addition of a "chain reaction", forming a square, represents a continuously burning fire.

2.2 Properties of flammable material

**Duration:** 00.30

2.2.1 the following expressions will be defined:

- flammability
- ignition point
- burning speed
- thermal value
- lower flammable limit (LFL)
- upper flammable limit (UFL)
- flash point
- auto-ignition
2.3 Fire hazard and spread of fire

Time length: 01.30

2.3.1 The trainer will also define the terms:

- conduction
- radiation
- heat flow
- convection currents

2.3.2 And he will state that spread of fire occurs as result of equalization in temperature between fire and surroundings via:

- conduction
- radiation
- heat flow
- convection currents

2.3.3 Fire hazards in the engine-room including:

- combustible liquids
- hot surface
- hot work, e.g. welding
- auto ignition, e.g. oil dripping on hot surface
2.3.4 hazards in galley, including:
- combustible liquids, e.g. cooking oil.
- matches and cigarette smoking
- deflective electrical connections

2.3.6 hazards from cargoes, including:
- self-heating cargo and spontaneous combustion
- explosives

2.3.7 hazards from smokers and cigarettes, including:
- temperature of burning cigarette, which is 500 degrees celsius
- carelessness with cigarettes and matches,
  setting fire to bedclothes, wastepaper bin contents and furnishings

2.4 classification of fires and suitable extinguishing agents

Duration: 01.30

This lecture will deal with the different types of extinguishing agents and their use according to the category of fire.
Fires are classed according to the fuel and the most effective extinguishing agents, as follows:

- **Class A fires**: fire involving common combustible materials, which can be extinguished by the use of water or water solutions. Materials in this category include wood, cloth, paper, rubber and certain plastics.

- **Class B fires**: fire involving flammable or combustible liquids, flammable gases, greases and similar products. Extinguishing is accomplished by cutting off the supply of oxygen to the fire or by preventing flammable vapors from being given off.

- **Class C fires**: fires involving energized electrical equipment, conductors or appliances. Nonconducting extinguishing agents must be used for the protection of crew members.

- **Class D fires**: fires involving combustible metals, e.g. sodium, potassium, magnesium, aluminum. Extinguishing is affected through the use of heat absorbing extinguishing agents such as certain dry powders that do not react with the burning metals. This classification should aid crew members in selecting the appropriate extinguishing agent.
2.5 Fire extinguishing agents:

This will include the following:

- water
- foam
  - chemical foam
  - mechanical foam
- powder
  - dry sand
  - dry chemical
  - carbon dioxide (CO₂)
- inert gases
- halogenated extinguishing agents
  - Halon 1301 1211

In addition, safety matters and the limitation for using the agents will be discussed.

3 Fire prevention

Duration: 01.00

This lecture will aim at answering the following question:
If most shipboard fires can be prevented, then who is responsible for preventing them?
The answer is that fire prevention is the shared duty of each and every member of the crew.
No fire prevention effort or program can be successful unless it involves everyone aboard ship.
Fire prevention is a matter of attitude and therefore it requires effort and guidance.
A discussion on fire prevention will include:

- careless smoking
- spontaneous ignition
- faulty electrical equipment
- galley operation
- welding and burning operations
- fuel oil transfer, etc.

DAY 2 (See graph on page 80)

PRACTICAL

Introduction to practical training

Duration: 01.00

The practical training will aim at introducing to the students a real fire situation and familiarizing them with the different types of fires and the various fire extinguishers.

Training site:

Explanation of the factors to be considered in deciding on fire-fighting methods:

- accessibility of the location of the fire
- personnel present at the location of the fire
- reactions with the cargo
- equipment and fire-fighting agents appropriate to the fire.
1. Fire fighting drills

Duration: 04.00

1.1 Small fire (2 hours)

Demonstration of the correct use of portable fire extinguishers suited, respectively, for the following types of fire:

- materials, e.g. wood
- oil
- plastic
- electrical

Demonstration of the method to extinguish fires using a hose with water jet and spray nozzles and with foam applicator.

1.2 Extensive fires (2 hours)

Demonstration of the extinguishing of extensive fires of various types, including an oil fire, using as appropriate:

- water (jet, spray and fog application)
- foams
- powder
- CO₂
- halon
Using a lifeline but without breathing apparatus, make a demonstration by entering and passing through a compartment into which high expansion foam has been injected.

DAY 3 (See graph on page 80)

1.1 Introduction to breathing apparatus

Duration: 01.00

1.1.1 During this session, the instructor must describe to the students and then demonstrate how to dismantle and reassemble the compressed-air operated breathing apparatus (CABA):

1.1.2 the correct way to fit the face mask of a "CABA" and to check that it is airtight should be demonstrated;

1.1.3 the list of checks which must be made on a "CABA" before it is used and after it has been strapped on;

1.1.4 demonstration of the correct breathing technique to give a low air consumption for a particular exertion when using "CABA";

1.1.5 explanation of the reasons for not remaining in a toxic atmosphere until the "CABA" air bottles are empty;
1.6 Explanation of the actions which must be taken when the warning signal is given on a "CABA" that air pressure is low.

2 Practical training

Duration: 02.00

During fire drills on the practical training site, the student will use the breathing apparatus to fight fire in smoke-filled enclosed spaces.

This gives every trainee the opportunity to practise fire fighting with different methods available in order to give him confidence.

2.1 Demonstration of the use of the lifeline as a signal line in a smoke-filled space while wearing "CABA";

2.2 Demonstration of extinguishing an extensive fire wearing "CABA" in smoke-filled enclosed spaces, including an accommodation room or simulated engine room, and using as appropriate:

- water (jet, spray or fog)
- foam
- powder
.3 Introduction to search and rescue

Duration: 02.30

The search and rescue of trapped personnel is an extremely important aspect of every fire fighting operation. Rescue may be the first step in the operation, or it may be delayed because of adverse circumstances. The student should be trained in appropriate methods to search for and rescue victims. On the practical training site, the trainee will enter a smoke diving compartment wearing a breathing apparatus to locate and safely remove a "victim."

CONCLUSION:

Every seaman probably fears the consequences of a serious fire at sea, but unfortunately, awareness of the possibility of fire does not always lead to the attitude and actions necessary to prevent it. For this reason, emphasis will be put on the training of attitude and safety conscientiousness.

On completion of the three-day course, the trainees will be awarded with a basic fire fighting certificate of attendance which would be renewed every five years. To fulfill this requirement the basic fire fighting refresher course should be attended by the ratings.
4.5.2 FOUR-DAY INTERMEDIATE FIRE FIGHTING COURSE FOR 2nd AND 3rd YEAR CADETS

This course should include the following theoretical and practical elements:

**DAY 1: Theory** (See graph on page 60)

.1 **Fire Protection**

.1.1 **Fire chemistry**

**Duration:** 03.00

The content of this session will consist of:

.1.1.1 **condition for fire:**

- fuel;
- source of ignition;
- oxygen.

Emphasis will be put on the fire tetrahedron which be explained as a solid figure with four triangular faces. It shows the four things required for combustion:

fuel (to vaporize and burn), oxygen (to combine with the fuel vapor), heat (to raise the vapor to its ignition temperature) and the chain reaction (the chemical reaction among the fuel, oxygen and heat).
1.1.2 Main causes of fire aboard ships

This class will aim at drawing the trainees’ attention on the main causes which, i.a., are as follows:

- oil leakage in engine room;
- cigarette;
- overheating;
- galley appliances (stoves, flues, hotplates etc.);
- spontaneous ignition (cargo wastes, etc.)
- hot work (welding, cutting, etc);
- electrical apparatus (short circuit, non-profesional repairs);
- reaction, self-heating and ignition.

1.1.3 Ignition sources:

In this portion, the different sources of ignition will be listed:

- chemical;
- biological;
- physical.

1.1.4 Flammable materials:

This section will deal with:

- flammability;
- ignition point;
- burning temperature;
- burning speed;
- thermal value;
1.1.5 Fire hazard and spread of fire:

This session will deal with the different ways in which a fire is transferred. They are:

- by radiation;
- by convection;
- by conduction.

1.1.6 Fire fighting methods:

Duration: 01.00

Emphasis will be put on the following:
- Cooling;
- Displacement
- Emulsion
- Inhibition
- Isolation
- Separation
1.1.7 Extinguishing agents:

Duration: 01.00

- Fires in solid organic material, such as wood, paper and textiles are best extinguished by cooling.
  Such fires are usually called "A-fires" and portable fire extinguishers for extinguishing of A-fires are called "A-extinguishers".

- Fires in liquids, such as gasoline and kerosene, are usually called "B-fires". They are best extinguished by suffocation or inhibition.
  Portable fire extinguishers for such fires are called "B-extinguishers".

- Portable fire extinguishers: with an extinguishing medium which does not lead electrical current and which therefore can be used against fires in electrical equipment are given the additional designation "E".

- The extinguishing media which are used in portable fire extinguishers are:
  - water
  - foam
  - dry powder
  - carbon dioxide
  - halon

More details concerning these portable fire extinguishers must be given during this session.
2 Fire prevention:

Duration: 00.30

This session will deal with the measures to be taken in case of fire on board and the methods to be used to prevent them.
The topics to be covered are the following:
- design features (SOLAS 74 chap II-2)
- training of crew attitude

3 Fire detection:

Duration: 00.30

3.1 Fire and smoke detection systems:

This class will:
- describe the construction of an automatic fire detection system;
- describe the characteristics of each main type of smoke or fire detector.

3.2 Automatic fire alarm

Duration: 00.30

This class will describe the operation of an automatic fire alarm.
DAY 2: (See graph on page 80)

.1 Presentation of a video film regarding a ship on fire

.2 Stability of a vessel involved in fire fighting

Duration: 01.00

This segment will aim at stressing the basic principles of vessel stability (forces which affect stability) and how fire fighting with mainly water can modify these forces.

.3 Fire fighting equipment

Duration: 03.00

This session will prepare the trainee for the practical fire fighting course. Therefore, he must be familiar with the fire fighting equipment which is the same equipment met on board "SITRAM" ships. The equipment is as follows:

- fire hoses;
- nozzles;
- fire axes
- portables extinguishers;
- fire blankets
- fireman's outfit;
- breathing apparatus;
- smoke helmet or mask;
- fireproof life-line and harness;
- carbon dioxide extinguishers;
- dry powder extinguishers;
- halon extinguishers;
- portable foam systems;
- protecting fire clothing.

Emphasis will be made on the proper use, and maintenance of this equipment.

Information on several types of fire fighting equipment existing on board ships such as:

- fixed installations;
- fire mains, hydrants;
- automatic sprinklers system;
- emergency fire pump;
- inert gas system;
- smothering installations, carbon dioxide (CO₂), foam;
- halogenated hydrocarbon.

**DAY 3:** (See graph on page 80)

Presentation of a video film regarding fire fighting aboard ship

Practical training:

**Duration:** 05.30

During this session which will take place on the training site, the 1st year cadet practical training will be entirely repeated.
DAY 4: (See graph on page 80)

Practical training:

Duration: 02.00

This session will aim at learning how to handle correctly and quickly the different types of hoses and connect them to fire hydrants and nozzles. The trainee will also practice how to lay the hose flat on the deck, to fold, roll it up completely and finally to secure and stow it ready for the next time.

Debriefing:

Duration: 02.00

The debriefing will enable the instructor to get not only feedback from the trainees but also to measure the effectiveness of the training. As a result, improvements will be made if necessary.

The four-day intermediate fire fighting courses for 3rd year cadets will lead to a certificate of attendance. On completing the theoretical and practical training successfully, the students will be awarded with this certificate which together with the survival at sea certificate, is mandatory for the awarding of the diploma (DESM 1ere partie).
Conclusion:

The intermediate four-day courses cover wider areas and provide further details than the three-day basic course. Consequently, it will constitute part of the five-day advanced fire fighting upgrading course.
4.5.3 FIVE-DAY ADVANCED FIRE FIGHTING COURSE FOR 4th YEAR (MATES AND ENGINEERS)

The cadets who are supposed to attend this course are awarded with the mate's certificate. They have at least 36 months of sea service, 12 as watchkeeping officer.

As a result, this course will deal with the integral subjects studied during the four-day intermediate fire fighting course complemented by some other subjects such as fire safety.

In view of the above,

Day 1;
Day 2;
Day 3;

programmes will remain the same as those described for the four-day fire fighting course. They are considered as refresher. (See graph on page 80).

In addition, the new subjects will include the following:

Day 4: updating (See graph on page 80)

Practical training:

1 Organization of fire parties;

Duration: 01.30

In this session, the trainees will be instructed in such matters as on the muster list and fire control plans and the various alarm
sounds. Emphasis will be made on a normal chain of command aboard every ship; from the master through his officers to their departments.

The instructor will stress the fact that the chief mate is responsible for carrying out the orders of the master in the chain of command and is usually in charge of safety, lifesaving and fire fighting equipment and the training of the crew. Thus he coordinates the fire fighting drills.

.2 Emergency procedures:

**Duration:** 01.30

In this session the trainees' attention must be drawn to the fact that the emergency duties assigned to a particular crewman on board ship should, whenever possible, be similar to the normal work activity of that person.

As mentioned earlier in the previous chapters, most fires aboard ships lead to disastrous consequences because of lack of coordination, communication and organization. Therefore, emphasis will be made on this part of training.
3 Emergency medical care

**Duration:** 01.30

This class will deal with:

- treatment of shipboard injuries during fire fighting such as:
  - skin scratches and life threatening problems;
  - respiration problems and resuscitation;
  - cardiopulmonary resuscitation;
  - fractures;
  - techniques for rescue and short distance transport.

**DAY 5:** (See graph on page 80)

.1 Maintenance of fire fighting equipment

**Duration:** 02.30

This class will aim at giving to the trainees some guidelines in maintaining the fire fighting equipment on board ships.
1.1 The supervision involved is a simple control and should be carried out at least once a month. It should, i.a., include:

- control that the extinguishers are located correctly;

- control that the seal is unbroken;

- control of the position of the pressure indicator;

- control that the space is not blocked;

- control that the warning sign is undamaged (1).

(1) Handbrand Släckare 1986
Published by the Swedish Fire Protection Association (SBF).
1.2 The function control involves an extensive operation which should be carried out with intervals of not more than two years. The function control shall be carried out in accordance with the detailed checklist established by the National Rescue Service Administration taking into account service instructions issued by the manufacturer.

1.3 Periodical survey: means control in accordance with legislation of the pressure vessels. The periodical survey shall be carried out by a person authorized by the authority (1).

2 Debriefing

Duration: 02.00

For the instructor this class will aim at getting feedback from the trainees which will enable him to evaluate the course and then to correct his errors for further improvement of the training.

(1) Handbrand
Släckare 1986
Published by The Swedish Fire Protection Association (SBF)
On completion of this course, the trainees will be awarded with a five-day advanced fire fighting training course certificate.

As I have already suggested earlier, the fire fighting certificates delivered for 3-day basic, and 5-day advanced fire fighting training courses should be renewed every five years. Therefore, "SITRAM" our national company and the port office in accordance with the Regional Academy of Maritime Science and Technology will select among the officers on leave those who have fulfilled this requirement to attend the refresher course in order to renew their certificate before a new embarkation.

The whole basic fire fighting training programme delivered to the ratings three years earlier will thus be repeated.

The same procedure will be applied to:
- sea-going officers (masters, chief engineers, mates and engineers);
- shore-based maritime personnel (port officers)

The entire 5-day advanced fire fighting programme will be fully repeated and complemented by new subjects:
- Calculation of the working duration of a CABA;
- Description of how fire fighting team is made up;

- fire investigation and reporting;

Emphasis will be put on fire involving dangerous goods. The trainees must be acquainted with the classification, identification, stowage and the use of the correct extinguishing agent, if a fire occurs.
COMPARISON OF COURSES

1. PRESENT FIRE FIGHTING COURSE
2. 3-DAY BASIC FIRE FIGHTING COURSE
3. 4-DAY INTERMEDIATE FIRE FIGHTING COURSE
4. 5-DAY ADVANCED FIRE FIGHTING COURSE

THEORETICAL TRAINING (THEORY OF FIRE)

PRACTICAL TRAINING (TYPES AND USE OF FIRE EXTINGUISHERS)

PRACTICAL (WEARING OF A BREATHING APPARATUS, FIRE EXTINCTION)
PRACTICAL (EXTINCTION OF FIRES)

THEORETICAL (SAFETY AND ITS PRINCIPLES)

THEORETICAL (FIRE PREVENTION)

PRACTICAL (FAMILIARIZATION WITH DIFFERENT TYPES OF FIRES)

PRACTICAL (SEARCH AND RESCUE)

THEORETICAL (FIRE FIGHTING METHODS)

THEORETICAL (FIRE DETECTION)

THEORETICAL (VESSEL STABILITY)

PRACTICAL (CORRECT AND QUICK HANDLING OF FIRE EQUIPMENT AND THEIR GOOD STOWAGE)

DEBRIEFING

ORGANIZATION OF FIRE PARTIES

EMERGENCY PROCEDURES

EMERGENCY MEDICAL CARE

MAINTENANCE OF FIRE FIGHTING EQUIPMENT
The graph on the previous page shows the differences in duration between the present and the proposed fire fighting courses. It also shows the similarities between the contents of courses. If the proposal is accepted, then the present offer will be replaced by the proposed one.
ISSUE OF CERTIFICATES:

With regard to IMO Resolution A.437 (XI) adopted on 15 November 1979 on the "Training of Crews in Fire Fighting" special certificates will be relevant to the different courses for the trainees who have successfully taken part in the whole course. These are as follows:

- A certificate for the ratings Basic Fire Fighting Course in accordance with the provision of Annex I of IMO Resolution A.437 (XI) (validity: five years);

- A Certificate for the Advanced Fire Fighting Course in accordance with the provisions of Annex II of the same Resolution (validity: five years);

- A certificate for the ratings Basic Fire Fighting Refresher Course (to be renewed every five years);

- A certificate for the Advanced Fire Fighting Refresher Course (to be renewed every five years).

A form of the certificates provided for IMO short courses and amended in the context of the proposed fire fighting courses is appended.
In addition, for evaluation purposes the participants will fill in certain questionnaires provided for IMO short courses, (see form in appendix).
5. CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

Cote d’Ivoire, as a young country, has made a great deal of effort since the establishment of the Maritime Training Centre in 1957 until the foundation of the Regional Academy of Maritime Science and Technology, Abidjan to train a great number of seafarers from west and central African French speaking countries. However, in view of the country’s present financial difficulties, the institution is run with a limited budget. For this reason the amount of equipment available for training purposes is also limited. Moreover, I am very hopeful that after the effective regionalization of the “RAMST”, if the members undertake to fulfill their obligations by paying their contributions, things will improve. However, the training at the “RAMST” as a whole, including the fire fighting department, is still going on.

The construction and operation of today’s ships of all types amplify the need for a more organised approach to fire fighting skills including the correct use of equipment and more adequate fire fighting drills.

On board today’s ships, it is necessary to continuously update standards of training in order
to improve the skills of the personnel in the field of the organization of fire fighting and fire prevention.

5.2 RECOMMENDATIONS

In view of the technological development of fire fighting services ashore compared to those at sea, I recommend close contact between the RAMST fire department and the fire brigade.

For the advanced fire fighting upgrading and advanced refresher courses, I recommend the inclusion of part time lectures from the fire brigade.

For the training of the shore-based personnel, like the port officers in fire fighting, the RAMST fire department should co-ordinate with the harbour master to bring this about successfully.

In order to exchange information and experiences, I recommend contacts between the RAMST fire department and other fire fighting and safety centres as e.g. in UK (Warsash), FRG (Travemünde) and Algeria (Bou Ismaïl).

In the framework of the World Maritime University (WMU) Branches, I recommend a contact between the RAMST fire department and WMU graduates at safety training centres.

Safety on board Ivorian merchant ships and safety in ports are very important. Therefore, I recommend
the adequate training of seafarers and shore-based maritime personnel in order to cope with the various tasks relating to the ships which, i.a., include fire extinguishing.

In spite of the fire drills which take place regularly on board ships at sea as well as in the ports, seafarers after a certain period of time lose part of their previous knowledge and skills. Therefore, I recommend certain refresher courses, not only for sailors to overcome this handicap, but also to renew their fire fighting certificates.

In order to run the fire fighting courses safely and also to achieve efficiency in the training, I recommend the acquisition of the equipment mentioned in chapter 4 and in annex 1.

In view of the perpetual changes in shipping the RAMST's lecturers in general and the fire fighting instructors in particular need to be continuously updated.
BIBLIOGRAPHY

1. Frank Rushbrook "FIRE ABOARD"

2. IMO MODEL COURSE 1.20
Basic Fire Fighting, 1966.


Annex 1

List and cost estimate of the equipment to establish the necessary prerequisites of the improvement of the fire fighting training:

- 10 self-contained, demand-type breathing apparatuses "SPIROMATIC"
  2*400 litres 30 bar ............SEK (1): 12,000*10

- 15 pairs of anti-fire gloves.....SEK: 300*15

- 15 goggles......................SEK: 60*15

- 15 pairs of boots..............SEK: 450*15

- 15 helmets (in cotton).........SEK: 100*15

- 15 fire protective clothings....SEK: 1000*15

- 5 fire hoses (63 mm diameter)
  25m length......................SEK: 1000*5 (2)

______________________________________________________________

(1) Swedish Kronor

(2) BICAPA AB
  Professorsgatan 5
  Box 23005
  200 45 MALMO, SWEDEN.
- 5 fire hoses (38 mm diameter)
  - 25m length .................. SEK: 631x5

- 2 overhead projectors ........ SEK: 3000x2 (2)

(2) BICAPA AB
Professorsgatan 5
Box 23005
200 45 MALMO, SWEDEN.
ATTESTATION DE STAGE

CERTIFICATE OF ATTENDANCE

Le Directeur Général de l'Académie Régionale des Sciences et Techniques de la Mer
The General Director of the Regional Maritime Academy

certifie que Monsieur ........................................... né à .................................. le ....................
certifies that Mr. ........................................... born at .................................. on the

a suivi avec succès un stage de formation sur la LUTTE CONTRE LE FEU
has successfully completed a course on FIRE FIGHTING

comme le recommande la RES. A.437 (XI) Annex I de l'OMI
as recommended by IMO Res. A.437 (XI) Annex I

qui s'est déroulé à l'Académie d'Abidjan du ................................ au ....................................
which took place at the Academy of Abidjan from to ..............................................

The validity of this certificate expires after five years from:

Fait à Abidjan, le ..............................................

Le Directeur Général
Le Directeur Général de l'Académie Régionale des Sciences et Techniques de la Mer  

The General Director of the Regional Maritime Academy

certifie que Monsieur .............................................. né à ..................................... le ................................
certifies that Mr. .............................................. born at ..................................... on the

a suivi avec succès un stage de formation sur la LUTTE CONTRE LE FEU

has successfully completed a course on FIRE FIGHTING

comme le recommande la RES. A.437 (XI) Annex I de l'OMI

as recommended by IMO Res. A.437 (XI) Annex I

qui s'est déroulé à l'Académie d'Abidjan du .............................................. au .....................................

which took place at the Academy of Abidjan from .............................................. to .....................................

The validity of this certificate expires after five years from:

Fait à Abidjan, le ..............................................

Le Directeur Général
ATTESTATION DE STAGE
CERTIFICATE OF ATTENDANCE

Le Directeur Général de l'Académie Régionale des Sciences et Techniques de la Mer
The General Director of the Regional Maritime Academy

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a suivi avec succès un stage de formation sur la LUTTE CONTRE LE FEU
has successfully completed a course on FIRE FIGHTING

Advanced Fire Fighting Course

comme le recommande la RES. A.437 (XI) Annex II de l'OMI
as recommended by IMO Res. A. 437 (XI) Annex II

qu'il s'est déroulé à l'Académie d'Abidjan du ......................................... au ...................................
which took place at the Academy of Abidjan from to

The validity of this certificate expires after five years from:

Fait à Abidjan, le ........................................

Le Directeur Général
Académie Régionale des Sciences et Techniques de la Mer

ATTESTATION DE STAGE

CERTIFICATE OF ATTENDANCE

Le Directeur Général de l'Académie Régionale des Sciences et Techniques de la Mer

The General Director of the Regional Maritime Academy

certifie que Monsieur ........................................... né à ......................................... le ..................
certifies that Mr. ........................................... born at ......................................... on the

à suivi avec succès un stage de formation sur la LUTTE CONTRE LE FEU
has successfully completed a course on FIRE FIGHTING

comme le recommande la RES. A.437 (XI) Annex II de l'OMI
as recommended by IMO Res. A.437 (XI) Annex II

Advanced Fire Fighting
Refresher Course

qui s'est déroulé à l'Académie d'Abidjan du ........................................... au .........................................
which took place at the Academy of Abidjan from ......................................... to .........................................

The validity of this certificate expires after five years from:

Fait à Abidjan, le .........................................

Le Directeur Général
Evaluation Questionnaire*

Source: IMO Short Courses

1. Please complete the following:

Your name and nationality:

__________________________________________________________

Name and address of your office:

__________________________________________________________

Phone: __________________ Telex: ___________________ Cable:

__________________________________________________________

Your professional background:

__________________________________________________________

Nature of your organization (state whether governmental, private or a combination, etc.):

__________________________________________________________

Your title/position:

__________________________________________________________

Your main functions:

__________________________________________________________

2. Was the information you received before the course sufficient and timely? Yes □ No □
If "No", please specify:

__________________________________________________________

3. Did you have any special problems or difficulties when you applied for and prepared to attend the course? Yes □ No □
If "Yes", please specify:

__________________________________________________________

* Completion of this questionnaire by the participants will assist the Organization in the evaluation of the course and effecting improvements, if any, required in the organization and conduct of future courses. Your answers will be kept confidential and will be used only for evaluation purposes.
4 Was the course (please check appropriate box)

(1) too long [ ] (2) just right to cover [ ] (3) too short [ ] topics fully

If you have checked the first or third box please give your comments.

________________________________________________________________________

5 Using the scale 1= excellent, 2=very good, 3= good, 4=satisfactory, 5=poor, 6= very poor and N.A. = not applicable — please rate the following aspects of the:

.1 Course

Organization [ ] Facilities [ ] Equipment [ ]

Overall quality of documentary [ ] Overall quality of lecturers/trainers [ ]

.2 Documentary material

Presentation [ ] Clarity [ ] Technical/Analytical [ ] Comprehens-

Rigour [ ]

[ ] siveness

6 Please give any other specific comments you may have on the performance of the lecturers/trainers, specially in respect of presentation and grasp of topics.

________________________________________________________________________

7 Please mention the topics that were of:

.1 most interest to you:

________________________________________________________________________

.2 little or no interest to you:

________________________________________________________________________

8 Are there any topics you would find relevant to add to the programme of the course? Yes [ ] No [ ]

If "Yes", please list them:

________________________________________________________________________
9 Was the objective of the course met? Yes ☐ No ☐

If you checked "No" comment on the ways in which the course failed to meet its objectives:

__________________________________________________________________________________________________________________________________________

10 Do you have any other comments on the programme and organization of the course? Yes ☐ No ☐

If you checked "Yes", please specify:

__________________________________________________________________________________________________________________________________________

11 Will you be able to transfer your acquired knowledge/skill to other people in your country? If so, how?

__________________________________________________________________________________________________________________________________________

12 Will the particular organization/institution you work for benefit from your participation in the course? Please specify.

__________________________________________________________________________________________________________________________________________

13 Would you recommend participation in similar courses to your colleagues? Yes ☐ No ☐

If "No", why?

__________________________________________________________________________________________________________________________________________

14 Do you see any need for further assistance from IMO in the field covered by this course? Yes ☐ No ☐

If "Yes", please specify:

__________________________________________________________________________________________________________________________________________

15 IMO intends to organize courses similar to this one. Have you any suggestions for further improvement of such courses? Yes ☐ No ☐

If you checked "Yes", please specify:

__________________________________________________________________________________________________________________________________________