Steamship fire safety for American vessels from 1904 to 1925

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STEAMSHIP FIRE SAFETY
FOR AMERICAN VESSELS FROM 1904 TO 1925

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PREFACE

This study encompasses a period which was probably the most significant in American steamship history -- from the burning of the GENERAL SLOCUM (1904) to 1925. It is not unusual for a major disaster to touch off a broad investigation into problems not necessarily directly related to the disaster itself. Thus, such studies provide data of interest in a general study; this is why the present paper deals so heavily in events while stressing trends. Because of the range of some of these investigation reports, a problem presents itself as to the proper scope a paper on "fire safety" should have.

Our considered opinion after working in the subject is that it was necessary to study all aspects of safety covered in the contemporary investigations. As this paper progresses into the study of the period, the justification for this position should become evident.

Were we to take up a series of studies on the various aspects of fire safety, such as inspection, smoke detection, or sprinklers, we would have a disjointed thesis. But by covering a period of time, we are able to see the topic in the light of human reactions and government operations.
We have taken a period of history which is fairly clearly defined and self-limiting and have taken all discussions directly or indirectly relating to factors involved in ship fires during that period.

Obvious starting point is the GENERAL SLOCUM fire, as will be seen in first chapter, which takes up the progress of fire safety and American steamboat inspection before this disaster.

The year 1925 as an end is rather less easily defined. For one thing, the retirement of Inspector-General George Uhler in that year ended a continuous career at the head of safety inspection and thus marks a symbolic "end of an era". Another reason for stopping at 1925 is the Clyde Steamship Company's rather strange series of fires during that year, which are covered in the author's undergraduate thesis on the subject at the University of Richmond. Further, and most important, any study from 1925 onward would of necessity entail topics which are naturally prefatory to the second International Conference on Safety of Life at Sea.
CHAPTER I
AMERICAN FIRE SAFETY BEFORE 1904

The awesome threat of fire aboard a ship at sea, even in this day of wireless and the "fireproof" ship, is one of the great fears of mankind. How much more so it was when steamers were of wood, unregulated as to cargo and construction! Prior to the momentous New York harbor excursion boat fire aboard the GENERAL SLOCUM in 1904, which took 955 lives, public awareness and thus Congressional action, on fire safety aboard ships was next to nil. ¹ Insurers, if not the public and the shipping trade, knew early that fire was the main cause of total loss of steamships at sea; the first transoceanic voyage of a partly-steam vessel, the SAVANNAH, was refused insurance for this reason. ²

The first legislative regulation of steamship construction related to fire safety was the Act of July 7, 1838, which required inspection annually of steamer hulls and semi-annually of boilers, but this merely checked for possible explosion danger. Likewise, the Acts of March 3, 1843, requiring signal lights and after steering,

regulated only cases of explosion and collision.  

Two memorable steamship fires, the LEXINGTON and the G. P. GRIFFITH, had much effect of a positive nature on the earliest United States steamer safety regulations, so much so that they rate discussion here. First of these, aboard the LEXINGTON in Long Island Sound, 1840, was important in bringing about the 1843 Acts. The 1838 Act had required three lifeboats on each passenger steamer, but had not called for firefighting tools, perhaps on the premise that a ship afire cannot be saved, but must be abandoned. Investigations of the LEXINGTON fire by authorities caused a popular stir, even to the extent that the proceedings were published in book form the same month, January 1840.

Commodore Cornelius Vanderbilt, who had built the ship but said he had sold her in 1838, stated that her boiler had had 30% more boiler fastenings than required, was quoted as making the rather sensational statement that "I don't recollect whether she ever took fire -- it is so common a thing for a steamboat to take fire, that I cannot really remember about the Lexington".


She had a fire engine, but Congress was moved to make further requirements for fire safety; the Congressional committee's recommendations included sheet iron lining for boiler rooms, an underlining of sheet lead in the boiler's wake, a constant fire watch, and more sufficient lifeboats, but the actual legislation was far less.7

The second of the early fires to bring action was that aboard the G. P. GRIFFITH, which burned June 17, 1850, with 326 aboard, most of whom died. The GRIFFITH caught fire on Lake Erie, lodged on a bar, and was destroyed there.8

The Steamboat Act of August 30, 1852 resulted from the stir which followed this fire; this Act was the basic law for steamship safety for over three-quarters of a century. Clearance of 18" was required between any hot boiler, pipes, or machinery and any woodwork or other combustible, with free air circulation about any hot metal. Authority for organized inspection service was given in the legislation by providing for nine supervising inspectors to look after the local inspection of lifeboats, life preservers,


6. Ibid.


8. Dana Thomas Bowen, Shipwrecks of the Lakes (Daytona Beach: Dana Thomas Bowen, 1952), 18-19.
licensing of passenger vessel engineers and pilots, and required the stamping of boiler plates by local inspectors of boilers after they had approved each plate. The Act was successively amended over the years.9

The 1852 Act was hailed as a great improvement by the inspectors. The supervising inspectors were meeting as an informal board to unify their efforts; in 1857 they cited that there had been appreciable decline in loss of life by explosions due to the new laws.10 But fire and collision were now the major problem for American steamers. The use of hair felt had been tried successfully in 1855, and soon came into acceptance. However, it was not until 1875 that iron deck beams were being used around the boiler areas.11

The first iron-hulled steamer built in the United States is thought to have been the J. W. EVERMAN, around 1850, and the first all-steel steamer the IROQUOIS, built in 1886. It should be noted here that "all-steel" did not mean that the wood components were largely gone, but that the hull and major structural members were metal.12

Smoking on ships seems to be one of the principal fire hazards, then and now. Though today there are many "no smoking" signs on every ship, there is much suspicious


investigation into the place of cigarettes in causing a great number of steamer fires; a paper today and one half a century ago on the subject might use similar language in regards to this matter. 13

The formation of a formal Board of Supervising Inspectors and a Supervising Inspector-General at Washington did not eliminate the evil of paying the local inspectors of boilers and inspectors of hulls by the fees they collected, but it did provide an office at Washington. 14

The Board submitted to Congress some futile attempts at reform of inspection and safety for American steamers. One was before Congress March 29, 1904, just before the SLOCUM disaster, but was relegated to the special limbo for reforms not under outside pressure. But on June 15 of that year, the SLOCUM burned and some few attitudes were to change. 15

Even after the SLOCUM fire, a maritime authority, writing on fire at sea, said:

"It is one of the risks of the trade; and of course every trade has its special risks." 16

Yet another engineering authority, speaking before the


fire, stated that:

"the subject . . . has not yet received the attention it deserves from shipowners, shipbuilders, underwriters, or, as a matter of fact, from the public authorities controlling our maritime affairs." 17

This same author continues, lashing out at the then-current attitude:

"In fact, if only shipowners and shipbuilders would take the matter to heart, they would find that the moment they really wished to make their vessels safer from fire, they would be able to do so at a very small cost; whilst, of course, as long as they look upon safeguards with disfavour the extra expense will be described as enormous." 18


18. Ibid., 279.
GENERAL SLOCUM, Burned

W. T. Miller Collections
Steamship Historical Society of America
CHAPTER II
THE GENERAL SLOCUM CASE

On an overcast Thursday morning, June 15, 1904, the excursion boat GENERAL SLOCUM set off for an eventful cruise destined to kill 955 before the burned-out hulk would beach itself on Little Brother Island just a few miles up New York harbor. The congregation of St. Mark's Lutheran Church, inciting aboard, was almost wiped out by the holocaust which swept the all-wood ship unchecked by any trained crew or usable fire gear; the paddle boxes, where the boat's propellers churned the ship on course until bodies jammed them to a halt, were a mass of carnage; the captain paid no attention to the thousands who burned and screamed below as he refused to beach even after the SLOCUM was nothing but floating pyre in the middle of the city. Those who jumped were little better off, for the life preservers they wore mostly were weighted with bar iron or were rotten from quarter century in the salt air.19

So horrible was the incident that it prompted the largest investigation into safety of passenger ships since the GRIFFITH and LEXINGTON cases. A United States Commission started to investigate soon after the fire, reporting on October 8. The investigators found that the inspection

19. Merrill, op. cit.
certificate had been signed in the names of, but not by, James A. Dumont, inspector of hulls, and Thomas H. Barrett, inspector of boilers, for the port. The certificate had been granted May 6, 1904 for the carrying of 2,500 excursioners.20

First proceedings to try to find the cause of the fire was the coroner's inquest at New York. It turned out there that Dumont and Barrett had never actually inspected the ship, but that an underling, assistant inspector Henry Lundberg, had been in charge of the inspection. Lundberg refused to testify.21 The president of the firm owning the SLOCUM showed bills for the new life preservers he said had been recently bought for the vessel, but it was later shown that these were aboard another liner.22 It was also shown that the life preservers actually aboard were worn out from rot and had been inaccessible.23

Four indictments were handed down by the grand jury of the United States District Court for the Southern District of New York on July 24, 1904 under Section 5344 of the Statutes at Large, not under the steamboat act. Captain William H. Van Schaick was indicted for misconduct, negligence, and inattention to duty; managing directors Frank A. Barnaby, James K. Atkinson, Frank E. Dexter, and


22. Ibid., 246.

23. Ibid., 258.
John A. Pease were indicted to stand trial for aiding and abetting him in these offenses. Assistant inspectors John W. Fleming and Henry Lundberg were indicted for fraud, misconduct, and inattention to duty. Another indictment was filed against Van Schaick, Barnaby, Atkinson, Dexter, and Pease for aiding and abetting the Knickerbocker Steamship Company in fraud, misconduct, and inattention to duty; Captain Van Schaick was indicted alone for various other offenses.

During the investigations it was found that the life preservers had been weighted to bring them up to the required six pound weight by inserting bar iron in the cork panels; the manufacturers were indicted for conspiring to defraud the government and to prejudice the inspection laws.

President Theodore Roosevelt, in his preface to the investigation reports, said of the bar iron scandal:

"... This last offense was of so heinous a character that it is difficult to comment upon it with proper self-restraint. It appears the national legislature has never enacted a law providing in set terms for the punishment of this particular species of infamy, doubtless because it never entered the head of any man that so gross an infamy could be perpetrated. ..."

The U. S. Commission inquiry found that there was "no consideration whatever given to the question of inflammability." The SLOCUM was all of wood, much-painted


25. SLOCUM Comm., 61, 62.

and tinder-dry, and the commission found that "the sole protection of such a vessel against fire depends on prompt extinguishment at its early inception". Thus, the investigators called for better rules on extinguishment equipment. 27

Life preservers were taken up at length, and the law was found sorely wanting. The maximum passenger load limit policy was questioned (limits were set by inspectors), and it was found that law did not require life preservers for all aboard. Ferries were required at that time only enough for the average number to be carried, and excursion barges in tow needed only 25 to comply with law, no matter how many passengers were aboard; to top it all off, the regulations of quality were found wanting. 28

On the matter of extinguishing apparatus, stringent reformed rules were advised by the commission. Cheap linen hose then in vogue was found to deteriorate too rapidly to offer any practical assurance that there would be hose ready to use when needed, and the myriad of couplings in use were recommended to be standardized. A requirement to install hand fire extinguishers was recommended; carbon dioxide smothering devices for cargo holds were urged if equivalent to the then-current steam systems. The ease of casting off

27. SLOCUM Comm., 11, 51-52.
28. SLOCUM Comm., 52.
lifeboats in an emergency situation was also stressed as needing reform.28

Locus of responsibility was taken up by the commission next, and it was found that the captain in modern times is less independent than formerly, when captains were more than mere employees of a corporate giant and in many cases owned all or part of their ships; the commission wanted more responsibility put on the owners, but wanted the captains responsible to the Steamboat-Inspection Service on conditions aboard the ship and frequency of fire drills. The investigators further asked that the duties of the captain in equipping and navigation of the vessel be defined in the light of modern practice, and the responsibility of a charterer actually operating a vessel was questioned.29

The powers, duties, and methods of pay of the inspectors was also scrutinized by the commissioners. Inspectors, they said should have the power to see condemned equipment destroyed, with the power to withhold a certificate until this is done. Since reinspection was required only at a set schedule, the inspectors' powers to reinspect in case of suspicious situations was recommended with threat of revocation for refusal. After the SLOCUM fire, the

28. SLOCUM Comm., 53.
29. SLOCUM Comm., 53-54, 60.
Knickerbocker Steamship Company had balked three times on requests by the commission to reinspect the GRAND REPUBLIC, a sister ship, and finally the inspectors were forced into a partial survey while the ship was running. When a dangerous state of affairs was found, the owners had flatly refused to lay her up or remedy the situation. The commissioners wanted the inspectors to have the right to order a fire or boat drill at any time and a reinspection at any reasonable time. The hull inspector, they said, should be required to inspect all compartments and check lights at night.  

As to the actual methods of inspections, the commission advised that inspectors should handle each life preserver, check all hose at a hundred pounds per square inch, and check all pumps in actual operation; previously the fire apparatus had to be checked by both men during the survey, but the investigation commission thought that they should be permitted to work separately to save time. Furthermore, the recommendation was made that the persons actually doing the inspection should sign the inspection certificate.  

Third among the intense investigations into steamship fire safety in the wake of the SLOCUM fire was the meeting of the Board of Supervising Inspectors meeting called for

30. SLOCUM Comm., 55, 56.
31. SLOCUM Comm., 56, 58.
October 25 which sat through December 15; many reports were heard regarding rules, and the supervising inspectors looked at many types of lifeboats and other devices. The regular board meeting on January 18, 1905 made more recommendations for legislation and made some changes in the regulations.\textsuperscript{32}

The Supervising Inspector-General's report for 1905 is a comprehensive listing of grievances; we will examine some of them now. Inspector-General George Uhler's principal topic was the fireproofing of excursion boats, a 300' all-steel one being under construction at the time. He asked that this type of construction be required.\textsuperscript{33}

Further flaws in the law were cited by this report, many reiterations of previous complaints. The inspectors complained that they were powerless to inspect vessels operated by power other than steam under 15 tons displacement, though steam passenger vessels were controlled regardless of size. Uhler stated:

"There is no good reason why a vessel propelled by motor other than steam should be exempted from any of the requirements demanded of a steam vessel, or should be granted privileges not accorded others."\textsuperscript{34}

\textsuperscript{32.} SBIS Report, 1905, 19-20.

\textsuperscript{33.} SBIS Report, 1905, 21.

\textsuperscript{34.} SBIS Report, 1905, 10.
Crude oil, which did not enter the SLOCUM case, was taken up as a fire hazard in the inspectors' report. Uhler pointed out that though it was forbidden as freight with passengers aboard, it was permitted as fuel on passenger vessels with the consent of the Secretary of Commerce and Labor. The Inspector-General wanted a minimum flash point of 140°F Fahrenheit required as a fire safety factor.35

Resultant legislation, approved March 3, 1905, amended or repealed 21 sections of the steamboat laws; only one-third that many titles were changed within the next two decades, and most of these were minor by comparison.36

The report of the SLOCUM commission and the report of the Secretary of Commerce went to the chairman of the House Committee on Merchant Marine and Fisheries, Charles H. Grosvenor of Ohio, dated January 20, 1905. It included eight proposed bills to correct the many problems discovered in the course of the investigations.37

But Congress had already been active following the SLOCUM fire. A Congressional Commission to investigate the state of the merchant marine had been appointed to report on the general field of regulation; it had asked and gotten

35. SBIS Report, 1905, 16-17.
a month's delay in the due date of its report from December 5, 1904 to January 5, 1905. The report was introduced on January 4 with a minority report attached. Two days later the Commission recalled the paper and the included suggested legislation in view of developments (probably the forthcoming Secretary of Commerce report). Outside of the eight bills proposed in the Secretary's report, only two others were ever reported. One of these, S 6486, to amend the inspection laws on passenger lists, was reported January 19, passed the Senate February 1, passed the house February 3 and was signed by President Theodore Roosevelt February 9. This act outlined methods for listing age, sex, citizenship, and cause of death if the passenger were to die on board. The other, "to amend Section 4472 of the Revised Statutes so as to remove certain restrictions upon the transportation by steam vessels of gasoline and petroleum when carried in gas tanks of cars being shipped...", was introduced January 10. It provided that so long as there was no spark in the engine, cars could be shipped without having to drain the gas tanks. The bill passed, with some confusion as to when the spark should be turned off, and was signed

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by the President dated February 17.39

As will soon be seen, these are rather minor Acts compared to what was recommended by various investigators; the real action on the SLOCUM case bills was to come between introduction of the Secretary of Commerce's letter and the President's approval of reform legislation on March 3. The letter was approved by the House for publication on January 23, thus starting the chain of events with the introduction of the eight bills. The same bills were concurrently introduced into the Senate then.40

First of the bills considered was the proposal to allow the executive committee of the Board of Supervising Inspectors to make interim changes in the regulations of the Board at the call of the Secretary of Commerce and Labor and with his approval. This bill passed both houses with only an amendment requiring sufficient public notice as to the proposed changes before the meeting.41

Fees collected for the inspection of ships had formerly been the principal source of inspectors' incomes. The second bill was designed to eliminate abuses caused by this system, setting the salaries of local inspectors based

40. CR 39, 1276, 1280.
41. CR 39, 1274, 2053, 2404, 3632.
on fees collected the previous year, defining the duties of assistant inspectors, and permitting the Secretary of Commerce and Labor to transfer assistant local inspectors according to need. Though the bill passed, its intent was warped somewhat with pork barrel additions. As the bill at first read, there were to be six groups of inspectors with salaries from $1200 to $2500. Grosvenor introduced the bill with the statement that "vessels naturally go for inspection where inspection is most lax and the premium is therefore placed on inferior and improper work . . . " but Cincinnati's inspectors were in the $1200 class; before the bill could pass the House, the Louisville and Cincinnati inspectors were raised to the $1500 bracket. Representative James B. Mann of Illinois attacked the bill by saying that it was the same bill which had been defeated the year before, " . . . and the GENERAL SLOCUM disaster has simply been used as an entering wedge and as a hammer to put through a proposition which I understand originally was simply to increase the pay of the inspectors." One of his amendments was the pay raise.\textsuperscript{42}

After House passage of the bill with Louisville and Cincinnati pay raises, the Senate passed the bill with all the $1200 inspectors getting raises to $1500. Those who got the increases in pay were the local inspectors of hulls and

\textsuperscript{42} CR 39, 1274, 2053, 2561, 2407, 2666.
boilers for: Bangor, Maine; Apalachicola, Florida; Evansville, Indiana; Memphis, Tennessee; Nashville, Tennessee; Burlington, Vermont; Gallipolis, Ohio; Wheeling, West Virginia; Jacksonville, Florida. The House concurred.43

Third among the bills was the most all-encompassing of them, which included the provision already passed on gasoline in the tanks of cars being shipped. Other provisions included a prohibition against assistant inspectors having interest in a ship or in a patent article used on ships; to permit open launches to cover their inspection certificates as a matter of practicality; to put fifteen-ton motor vessels under the penal provisions of the steamboat laws; to allow appeal through the supervising inspector to the inspector-general in cases of suspension or revocation of licenses; allow carbon dioxide for smothering fires if adequate; to require hemp and cotton to be bagged in like materials to prevent chafing; to require collectors of customs to see inspection certificates before granting ships' papers; to include motor vessels in the Red and Mississippi Rivers under rules of the road for steamers elsewhere.44

43. OR 39, 3632, 3773.
44. Doc 258, 2-3.
This bill was introduced with the others in a package and reported without amendment; an effort on the House floor to make it cover only vessels carrying passengers for hire was rejected. There was considerable opposition to the bill in the House, but it emerged from Congress with only an amendment to make its wording the same as the former bill on carriage of gasoline in auto tanks.45

Putting teeth into inspection reports was the purpose of the fourth reform bill submitted, with minor change from Secretary Heflin's version. Annual inspection became compulsory and condemnation of defective gear was now to be effectively carried out. The lesson learned by the reinspection of the GRAND REPUBLIC (supra, p. 12) was applied by making it possible for the inspectors to revoke the certificate of a vessel found to be defective between annual inspections. Life preservers were to be provided for each person aboard and criminal action was provided for willful sale of defective lifesaving apparatus. Term charterers were made liable for violations of law and regulations on ships they operated and the directors and officers of corporations operating ships were liable for misconduct in the operation of their vessels. An amendment to require that 75% of the crew of licensed vessels be 19 years of age

45. OR 39, 1274, 2053, 2407, 2708, 3632, 3773.
with three years' experience, but this was rejected on the grounds that such a provision would put the Great Lakes under the Seamen's Union. 46

With the fifth and sixth bills of the series, we see an example of what was not passed being more eloquent than what was. The sixth bill, to amend Section 4399 of the Revised Statutes so as to place all vessels powered in whole or in part by steam or other machinery and carrying passengers for hire under the inspection laws, did not pass this time or during the entire period covered by this study. The bill died in committee, and was the only one of the SLOCUM bills not reported. 47

Omnibus changes in the steamboat laws were covered by the fifth bill, which changed certain details from the statutes to the Inspection Service regulations; bonds of inspectors were abolished because they were no longer under a fee system and no longer handled money. One section of the bill did not pass, this being the part to allow the Board of Supervising Inspectors to approve innovations in boiler fastening and to allow single riveting of boilers due to advanced methods of construction. 48

The seventh bill, designed to allow the inspectors to

46. Doc 258, 3; OR 39, 1274, 2053, 2404, 2405, 2453, 2891, 3632, 3773.
47. Doc 258, 4, 13; OR 39, 1274; SBIS Reports, passim.
48. Doc 258, 4; OR 39, 18201, 1274, 2053, 2406, 2453, 2708, 3632.
determine the number of licensed officers and crewmen a ship should carry. Here an attempt to put the 75% trained crew provision into the bill was partially successful, with the inland river boats exempted, but the bill itself was not passed. Another fatality among the bills attached to the Secretary of Commerce report, though it was not properly a SLOCUM case bill, was a bill for the appointment of a commission on marine construction.

Even with this mortality rate of proposed reform laws, 1905 ranks as the high point for the twenty years to follow. At this point, while we are discussing legislation, it is appropriate to follow the course of some of the laws mentioned above. Subsequent amendments to this legislation included:

March 17, 1906: to impose more inspection on foreign ships.
June 30, 1906: to amend Section 4471 on fire pumps.
March 4, 1909: to amend Section 107 of the Penal Code, on illegal fees and Section 282 of the Penal Code on loss of life at sea due to misconduct of officers and others.
July 17, 1914: to amend Section 4474, on carriage of crude oil.
March 29, 1918: to amend Section 4472, on petroleum as ship's stores.
March 2, 1925: concerning when the spark in the engine of an automobile being shipped must be put out.

49. CR 39, 2404; 3633; Doc 258, 5.
50. CR 39, 1274; Doc 258, 5, 14.
51. Laws Governing the Steamboat-Inspection Service 1925.
CHAPTER III
FIRE SAFETY FROM THE SLOCUM CASE TO LONDON CONFERENCE

The Supervising Inspector-General's report for 1906 renewed the plea for regulation on the transportation of crude oil, which was not to come until 1914; as to the laws growing out of the SLOCUM case, he said they were working well by then.\(^{52}\)

He stated that the iron fireproof excursion steamer he had mentioned in 1905 (supra, p. 13) as being under construction had been a success. This vessel was the JAMESTOWN, built for traffic between Washington and Norfolk during the Jamestown Tercentenary; she was stricken from Lloyd's Register of Shipping a few years later as "converted to a lighter." In fact, by 1909 she had already been sold into Argentina for the coasting service; Uhler insisted, however, in his reports, that such construction should be required by law.\(^{53}\)

Failure of Congress to enact a law putting motor ships of similar types under the same rules as steam vessels was a running theme of Uhler's reports throughout the period of this study. All motor vessels had to do for officers was to

\(^{52}\) SBIS Report 1906, 14-15.

carry a licensed "operator" for captain, even if carrying passengers, so long as they were under fifteen tons. Such "operators" needed no examination. There was no way of restricting the number of passengers a motor vessel could carry nor was there provision for their safety between five and fifteen tons. Under five tons, Uhler complained, a motor vessel was subject to no restrictions whatsoever.\(^54\) During this time, the President appointed a commission to suggest revision of the safety laws, but nothing concrete came of it.\(^55\)

The Act of June 9, 1910, not included in the Steamboat-Inspection laws, required license inspection for operators of motor vessels, certain safety devices, and revocation of the licenses of violators, but still Section 4399 was not changed and motor vessels were not under the steamboat law.\(^56\) Therefore, the uninspected classes of motor vessels were drawing trade from the smaller inspected steamers; the steamboats were then further regulated by a rule which called for sufficient boats or rafts for all aboard.\(^57\)

By 1914, the inspectors still were complaining about motor vessels. Uhler called permitting buoyant cushion as the only life preserver required on a motor passenger ship "little short of criminal." He stated that a steam tugboat

\(^{54}\) SBIS Report 1907, 14.

\(^{55}\) SBIS Report 1908, 14.

\(^{56}\) SBIS Report 1911, 14; SBIS Report 1910, 13.

\(^{57}\) SBIS Report 1912, 14, 18.
crew was better protected from fire than a passenger on a motor vessel, and said that the Act of June 9, 1910 "far from meets the proper requirements for safeguarding life and property." He pulled no punches in lashing at the motor vessel lobby. "That upon which the owners of these vessels have insisted has not been liberty, but license, and the time has come when this matter should be given attention." 58

If there was any real general interest during this period in fire at sea as a separate safety problem, it evidently did not appear in print too conspicuously. The Library of Congress bibliography of select sources on fire prevention in 1912 carried only three titles on fire at sea among 221 listings. 59

Awareness of fire at sea may have been reawakened by the loss of the Canadian Northern Steamship Company immigrant ship VOLTURNO at sea October 9, 1913 with 136 lives lost. Let us hear the story from a contemporary:

"It was early on Thursday morning (October 9) that fire broke out. The vessel's hold was filled with terribly inflammable substances, such as chemicals, oils, and cotton. Some say that a cigarette thrown down a grating started the blaze, others that chemical action produced so-called 'spontaneous combustion ...'" 59


59. Library of Congress, Division of Bibliography, Select List of References on Fire Prevention, June 12, 1912.

The role of wireless in summoning a number of rescue vessels to a point in mid-Atlantic was praised at the time and today the VOLTURNO fire is regarded as one of the first demonstrations of what radio can be if properly used. One writer today says, "The globe-spanning medium of wireless had demonstrated that a United Nations of the Atlantic now could be called together to meet any emergency." But, of course, there remains the fact that 136 lives were lost.\footnote{Keith Jameson, \textit{303 World's Great Sea Disasters} (Derby, Conn.: Monarch Books, 1962), 54.}

It is interesting to note explanations for this loss; one directly afterward wrote:

"Here were gathered together, thanks to the agency of the Marconigraph, the finest fleet of liners ever assembled in the middle of the ocean, all fitted with the regulation number of boats, but, owing to the fierce wind and furious sea, all absolutely powerless.\footnote{Arthur Spurgeon, \textit{Burning of the Volturno} (London: Cassell and Company, Limited, 1913), 44.}

Another explanation of the disaster's high death toll gives a clue to the proper perspective. It has been noted that the KROONLAND, early on the scene, carried only 26 seamen, not enough even to man all her boats; she thus carried in only 38 survivors.\footnote{Florence Kelley, "Seamanship and Safety," \textit{Surveys}, XXXI (November 8, 1913), 154-155.}
CHAPTER IV

THE LONDON CONFERENCE AND ITS AFTERMATH, 1913 - 1925

Sinking of the TITANIC, the "unsinkable" aroused a call for a general conference of seafaring nations on safety of life at sea, which was held at London in 1913.64

Scientific American commented that "the lesson of the Titanic disaster has been laid well to heart; and it is realized that . . . every ship should be made its own lifeboat." With the International Conference soon to open at London, "the burning of the Volturno emphasizes the necessity for giving the deliberations of that gathering the broadest possible scope by including the subject of fire protection."65

The fact was that fire was increasingly becoming a problem aboard ships. Figures for British ships showed that casualties generally declined steadily from 1890 to 1913; the number involving loss of life declined, and fire alone among all causes for losses of ships increased. "Spontaneous combustion" as a cause rose from "a very small figure" to about 1.5% of fires. Figures included: with 3,601 steamers in British registry in 1890, 55 were lost to fire; in

64. Lloyd's List and Shipping Gazette, No. 35 (May 16, 1929), 759.

1913, fire claimed 134 of the 4,062 steamers registry listed. 66

Inspector-General Ulmer was among the official United States delegates to the London Conference and came away convinced that American methods of inspection were best, but he called for certain other reforms beyond those recommended by the Conference. 67

Summation of the work at the Conference was the International Convention on Safety of Life at Sea, first document of its kind, a statement of proposed rules for safe construction and operation of seagoing ships, which was submitted to the signatory nations for ratification. Provisions for fire safety were of a general nature, mainly dealing with construction and procedures. Article 12 required fireproof bulkheads not over 131 feet apart with fireproof recesses in them and fireproof doors through them; cargo or ballast which endangered passengers was forbidden by Article 55 and Article 56 required safety certificates which would be issued by the registering nation of a ship to assure that it met international standards. Regulation 49 of the appendix to the convention called for continuous fire patrol and for ships under 4,000 tons to have two fire pumps, those over that size to have three, with two water jets in any area of the ship, sufficient fire extinguishers, at least two in each machinery area along with

66. Sir Westcott S. Abell, "Sea Casualties and Loss of Life" (galley proofs), (Newcastle-Upon-Tyne: Northeast Coast Institution of Engineers and Shipbuilders, 1921), galley 3, 4, 5.
two sets of smoke helmet and safety lamp; each nation was to inspect for fire safety yearly. However, the safety regulations did not apply to any but vessels carrying over twelve passengers two hundred miles from shore.68

An example of the enthusiasm over the results of the Conference is the statement of E. T. Chamberlain in introducing the Convention to the Society of Naval Architects and Marine Engineers:

"The London Convention furnishes an impetus to high grade construction work in that it secures for such work international recognition." 69

Any enthusiasm for forthcoming uniform international safety regulations was dashed, however, by the Great War. As a result of hostilities, the Convention was never ratified by all the signatories and thus never went into effect; no nation completely adopted the requirements of the agreement unilaterally.70

The report of the Supervising Inspector-General for the following year after the Conference shows the actual progress, or lack of it, since the GENERAL SLOCUM fire, ten years before. Uhler remarked that a travelling

68. United States Senate Document 463, 63rd Congress, Second Session (in appendix to Transactions of the Society of Naval Architects and Marine Engineers, XXII, 220, 230, 252, 272, 216).
69. E. T. Chamberlain, "International Conference on Safety of Life at Sea", Transactions of the Society of Naval Architects and Marine Engineers, XXII, 1.
inspector had just started work and had uncovered several bad inspections, but was being regarded ruefully by the shipowners as a detective. The report continues:

"While we have been fortunate in not having any great fires recently on excursion steamers, it is a peril which none the less exists, and though we may have any number of regulations in regard to fire-fighting equipment, in order to prevent such another disaster as occurred on the steamer General Slocum the best way is to remove the cause for such a disaster and require absolute fireproof construction of excursion steamers. This can not be done until Congress acts, and the Bureau most earnestly invites attention to the necessity for legislation in this respect." 71

Uhler went on to examine other safety matters in regards to changes in statute which he felt necessary, including a new motor vessel law that would be easier to understand and coverage of fire law to cover freighters. He wanted more control over dangerous cargoes and over passengers on ferries; further, he asked for a plan of centralized approval of proposed ship plans by a board of architects in Washington. None of these were new recommendations; in fact, all dated to the SLOCUM fire and before. 72

A disaster in Chicago brought the steamship safety laws and inspection service under scrutiny next, and though

72. SBIS Report 1915, 30-34.
it is not a fire matter, if results could be measured, it probably had as much weight in public attitudes as any other disaster in relation to safety. EASTLAND, an excursion boat, had capsized while being towed away from her berth in mid-city laden with 2,500 picnickers. Her 1913 certificate had rated her for 600 passengers and a limit for excursion of five miles from shore; however, Grand Haven and Chicago inspectors had allowed her to cross the lake with four times that number. At the hearings, her architect called her "born a greyhound and died a wolf," and said, "speed was the essence of the contract, and carrying-capacity a secondary consideration." It was also found that, by some chance, the water ballast tanks had been empty and inoperable, making her unstable.73

Investigations of the disaster included a Cook County grand jury, a Federal grand jury, a coroner's inquest, Steamboat-Inspection Service investigation, and a separate inquiry by Secretary of Commerce William C. Redfield.74

Inspector-General Uhler's next report pointed out that excursionists had become aware that the steamers they were riding were overloaded, but he maintained that the local inspectors, knowing the ship, were best qualified


set the passenger limit. The bureau at the time of his 1916 report was preparing legislation to present to Congress in the spring of 1917.75

Changes in the steamboat law somewhat more satisfactory to the Inspection Service were made as a result of the investigation toward better handling overloading. Under the system, a supervising inspector checked on a local inspector, and any local inspector in doubt became able to call in an Inspection Service stability expert; still the law applied only to passenger ships, leaving freight steamers still outside most safety laws.76

The EASTLAND disaster focused more attention on hull inspection and architectural examination of plans to assure proper stability.77 The Board of Supervising Inspectors ruled in January 1922 that inclining tests should be run on all major size vessels; the Supervising Inspector-General repeated a request he had made before for some sort of board of naval architects at Washington to examine plans for stability and remove the cost of inclining the vessels themselves. Inclining tests, for want of such a board, continued to be made on many ships.78

75. SBIS Report 1916, 29.
76. SBIS Report 1917, 24.
77. SBIS Report 1919, 18.
78. SBIS Report 1922, 22, 23; 1925, 1.
The old problem of jurisdiction over motor vessels by the Inspection Service kept cropping up. Though motor boat acts had been passed, they were vague and inadequate; the Inspector-General questioned his own authority over large motor ships and asked a clearer control act in 1920; in 1924, the Board of Supervising Inspectors assumed such jurisdiction on the basis of certain vague wordings, which the solicitor of the Board questioned as to applicability. 79

CHAPTER V

TRENDS OF EXPERT OPINION DURING THE PERIOD

George W. Wylie of the Clyde-Mallory Steamship Company, speaking at the Sixth National Safety Congress, 1916, listed the important developments of the previous few years thus:

(A) The International Conference on Safety of Life at Sea (supra, p. 27)

(B) The Seamen's Act

(C) The Conference on Making Passenger Vessels More Secure from Destruction by Fire (infra)

(D) Reports of the Supervising Inspector-General

(E) The Report of the EASTLAND Investigation Commission (supra, p. 30) 80

Other than the meetings and investigations already mentioned, there was one particularly important conference concerned exclusively with fire, held in the office of the Secretary of Commerce in 1916. 81

Secretary Redfield presided at the meeting with representatives of shipbuilders, shippers, owners, the Navy, and the seamen; though the conference was very informal, a transcript was fortunately taken. The Secretary


noted that there had been 63 more or less total losses to American vessels from fire in the previous two years and that 31 extra inspectors had been added as one of the measures to combat hazardous conditions; the meeting was called to suggest further measures and legislations.82

Stevenson Taylor, president of the American Bureau of Shipping, remarked that the rebuilding of the Fall River liner PLYMOUTH in 1907 after her destruction by fire to the waterline had made her the most practical type of fire resistant vessel. Rebuilding with an all steel superstructure, he said, would have been impractical, causing a fourteen-inch loss of freeboard plus increased weight.83

W. O. Teague had said before the Society of Naval Architects and Marine Engineers two years before that it was practical to substitute steel for wood with a ten per cent rise in cost, which shipowners had wrongly called prohibitive. Warren T. Berry, however, at the meeting, had argued that the cost was far above Teague's estimates.84

Non-flammable wood had been one other partial attempt some had proposed toward fire safety even before the

82. Advisory Conference, 1-4.
83. Advisory Conference, 7.
PLYMOUTH rebuilding. Asbestos and paper pulp boards were other alternatives to ordinary wood. E. E. Olcott, of the Hudson River Day Line, cited at the advisory conference that asbestos had been used on the crew areas of the new WASHINGTON IRVING, but that this material was heavy and brittle; steel casing had been used over wood as a substitute device.

Engineering journalists were enthusiastic about the IRVING. The use of fire resistant construction had been "wherever practical usage will permit . . .", in such places as fire rooms, the galley, and so on. "The risk of fire on such a vessel is reduced to practically nil," the same report continued.

The one previous experiment with further fireproofing had been the JAMESTOWN, called all-steel, but actually with as much steel as technology at that time had known how to install. This made her ten per cent heavier, though her decks were still of wood, but encased in metal. Her builder, William Gatewood of Newport News Shipbuilding and Drydock Corporation, came out flatly and stated that nothing further on fireproofing excursion boats past the JAMESTOWN would be practical, though he declined to call


86. Advisory Conference, 9.
her strictly a fireproof ship. 88

Bulkheads were another prime topic introduced in the advisory conference first in the matter of the PLYMOUTH, which had been equipped with two transverse bulkheads for fire protection when rebuilt, with doors at the ends of her engine and boiler enclosures and in saloon passages. Gatewood countered that Newport News opposed fire doors on day liners as an obstacle to firefighting and movement of people rather than as a buffer to stop fires at bulkheads. 89 Ships of the time were generally built with the main cargo deck open the entire length of the ship; fire could spread to all areas through the hatch covers at any point; the engine rooms were not always bulkheaded off from the rest of the ship. 90

At this particular time, the United States had been recommending at international meetings that flammable materials be kept at least a foot from either side of metal subdivision bulkheads in ships carrying

88. Advisory Conference, 14, 15.
89. Advisory Conference, 8, 15.
cargo as a measure against heat conducted through metal.  

PLYMOUTH had had sprinklers throughout when rebuilt; these were attached to the fire pump system, which featured separate lines to each station from the pumps, so that if one fire station's line was broken, it could be shut off independent of the rest of the system.  

Use of sprinklers engendered more controversy among ship operators and builders than any other fire safety matter during the period. There were actually three points of view we have been able to discern; first, there was, of course, a party opposed to all sprinkler systems. Then there was the controversy between the "Wet System" (having water in the sprinkler lines at all times, under pressure), and the "Dry System" (in which an engineer turned water into lines feeding sprinklers which were always open, upon alarm of fire).

An attack on sprinklers was made in the discussion on W. O. Teague's paper cited above by Warren T. Berry and W. D. Forbes in 1914. Teague had stated that sprinklers cost about four dollars each, and Berry countered that the cost was more like seven dollars; he

91. Informal London Conference, November–December 1921, Safety of Life at Sea "Copied from Document obtained from files of State Department 580.7A1/213" (Washington: United States Shipping Board, mimeograph MSS, 1928), 4B.

92. Advisory Conference, 8.
argued that cargo breaks off sprinkler heads and is likely to damage the ship and its contents if filled with water. Forbes backed him by saying that Captain Francis Inch of the VOLTURNO had told him that sprinklers would not have helped in his case because the fire was guarded by layers of cargo from any firefighting from overhead. He compared sprinklers to "spit on a match" and said their usefulness was limited to small fires, advocating instead a simple perforated pipe dry system tied to a thermostat.93

Scientific American, on the other hand, said, "Why is it that the automatic sprinkler, which has proved so highly efficient ashore, has not been applied to the protection of ships?"94

However the arguments might have raged, a rule of the Board of Supervising Inspectors made April 8, 1916 required sprinklers and metal sheathing of exposed areas.95 By 1919 insurance authors were bold enough to say that the United States had better firefighting equipment than the Europeans, and that automatic sprinklers were the principal reason. Until forced by the rule, naval architects had failed to adapt sprinklers successfully to ships because of the danger of water damage from damage to the sprinklers, using the movement of cargoes and the wrenching of a hull

94. Scientific American, October 25, 1913, loc. cit.
during rough weather. The compromise was a dry system in which a thermostat in a hold or other closed place activated an automatic fire pump, which fed water into a sprinkler system in which the sprinkler heads were always open to a possible flow of water. Shipowners, however, continued to minimize the value of such devices.96

Cigarettes bore, as they still do, the biggest blame for ship fires at the time. The Hudson River Day Line representative at the advisory meeting stressed that no matter how fire resistant a ship was, the smoking habit was the uncontrollable factor.97 One old shipping hand put it to the author this way:

"The main difficulty with fires aboard ship is the cigarette fires. A large percentage of such fires could be avoided if those confounded coffin nails were completely banished." 98

Teague listed smoking as one of his principal five causes of fire, along with spontaneous combustion, volatile oils, woodwork in contact with steam pipes, and defective wiring.99

Tobacco is not the only human problem necessary to discuss; it falls as only part of the matter of concerned

97. Advisory Conference, 10.
attention to the aims of fire prevention at all levels. E. C. Bennett of the Fore River Shipbuilding Corporation brought this out at the advisory meeting this way:

"We have not yet found in building boats at Fore River a shipowner who paid extraordinary attention to fire prevention, other than that required by the United States supervising inspectors and classification societies."¹

The Fall River Line, its representative pointed out at the advisory meeting, had maintained a better than average record of fire safety; he attributed this to an administrative policy of constant fire drills and inspections.²

Andrew Furuseth, phlegmatic Seamen's Union president, advocated a call bell operated from bridge to crew quarters to more effectively rouse men to fight a fire, since ships in that period were getting larger and communications more difficult due to distance. Furuseth threw in the comment here that it was the cargo and not the ship itself that most frequently burned.³

Statistics showed that Furuseth was substantially correct in this latter statement. In a survey of United States ship fires from 1911 to mid-1920, it was found that 65% started below decks, and of these, 72% were in

2. Advisory Conference, 8.
cargoes. Yet, though fire alarms were required, there is evidence that the inspectors in practice did not require them in cargo areas.4

Stowage of cargo so as to prevent spontaneous combustion in cargoes and "all-important" patrols of out-of-the-way parts of the ship had long been urged as the easier way to prevent large fires, by catching them small.5 Control of small fires before they got too large to fight was the subject of several papers. Sachs called for buckets and hand pumps as the most effective preventive to keep small fires from spreading.6 The principal recommendation on fire safety at the international shipping conference of 1928, in fact, was the calling for sand or other dry material to be kept in the stokehold of oil-burning steamers to smother oil fires likely to start there.7

The Rich System of fire detection was hailed as a great advance at the time; it consisted of a series of pipes from each compartment of the ship to a box in the pilot house. This box had a glass front and an outlet into the area within the pilot house. Through the opening,


6. Ibid., 276.
smoke from the holds could pass into the pilot house and be smelled, alerting the officer on duty, who could look into the box and see which pipe, and thus which hold, smoke was coming from. He could then, through the same pipe, send steam by a valve system into the hold. Steam for fire extinguishing was an old standby; in 1914 the Steamboat-Inspection Service was calling it the best way to fight a fire in a hold, better than flooding, which caused a stability problem, or gases, which had not yet proven their worth.

Carbon dioxide as a smothering agent had been widely suggested, but was not as simple to provide as steam. One solution was to install carbon dioxide generators. Another contemporary idea was to carry the carbon dioxide gas in forty-pound tubes, one for each thousand cubic feet of air space enclosed in holds; Teague held that this gas was impractical to manufacture on a ship, but that sulphur dioxide as a smothering agent had been made and used successfully on ships at sea.


Yet, with all this discussion on what makes a ship fire-safe, it is appropriate to note that about twenty years after the advisory conference, the HORRO CASTLE burned. Though she had been a new ship, her furnishings, panelings, and staircases were of combustible material; she was open through stairwells between decks, a feature which made these escape routes into chimneys instead. She had all the required extinguishers and alarms, but the latter were not in the public areas where the fire got its headway. Carbon dioxide outlets were located in the holds and engine spaces only and there were no sprinklers. Result: fire got its headway in the writing room and the ship was lost.12

Even though such abuses were permitted even after the period under study, the fatality rate for American seamen in 1917 was still only three per thousand as compared to the British rate of five per thousand.13


CHAPTER VI

SUMMARY AND CONCLUSIONS GAINED FROM THIS STUDY

Since the nature of this study was political, economic, and technical, there have been quite a few figures studied in attempting to gain a picture of advances made in a very human problem: safety of life from fire at sea. In such a study, then, it seems meet for the final chapter to deal with the human values.

But before we go into purely human aspects, there are two appended tables here to study, which are by way of summaries. The first, a chart of losses by fire for the first decade of the period under study, is interesting in that the total number of fires for 1905 was identical to the number for 1914; there were more lives lost per year, with one exception, toward the end of the decade than in the earlier part. Contrast this with the growth of the personnel of the Steamboat-Inspection Service, and a question is sure to arise. That question is:

In the light of these two charts, and considering the facts previously presented in this study, can it be said that there was actually any progress made in the general field of making American shipping as a whole secure from loss by fire?

Since this study at the outset was predicated on the idea that there was indeed action during the period, especially after the SLOCUM fire, this is the question which must be at least tentatively answered by this paper.
CHART OF LOSSES BY FIRE TO AMERICAN VESSELS, 1905-14, COMPILED FOR THE AMERICAN SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS, NATIONAL ARCHIVES

<table>
<thead>
<tr>
<th>PERIOD ENDED</th>
<th>CLASS OF VESSEL:</th>
<th>PASSENGER</th>
<th>FREIGHT</th>
<th>TOW</th>
<th>FERRY</th>
<th>MOTORSHIP</th>
<th>STEAM YACHT (PLEASURE)</th>
<th>MISCELLANEOUS VESSELS</th>
<th>TOTAL</th>
<th>LIVES LOST</th>
<th>PROPERTY LOSS</th>
<th>EXPLOSIONS</th>
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<td>8</td>
<td>9</td>
<td>16</td>
<td>3</td>
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In the first chapter, we retraced some of the high points of fire safety rules up to the period under study; there, as well as in the body of the paper proper, a significant trend was discernable of action following most frequently upon public indignation or concern in the wake of some spectacular disaster. We have mentioned the LEXINGTON, GRIFFITH, SLOCUM, TITANIC, VOLTURNO, and EASTLAND disasters and the uproars which followed them.

But it has also been shown how the legislation which followed each of these disasters was not a new idea at the time, but an enactment of one principle or another that the experts and safety men had been calling for previously. Furthermore, it has been significant to note during the period under study that the enactments of Congress did not represent the solutions to the problems as recommended, but were only as much as was necessary to placate the voters.

This brings up the question of pressure groups of shipowners and builders. What part did they play in retarding legislation which might prove costly to them? Clues to this matter might come from the statements in connection with the sprinkler controversy; purely safety-minded writers were advocating sprinklers, as we have shown, long before they were required by law. When the law finally did require these devices, the shipowners found
PERSONNEL
OF THE STEAMBOAT-INSPECTION SERVICE FOR JUNE 30 OF YEARS SHOWN,
compiled by the author from the annual reports of the supervising
inspector-general, National Archives, MSS and printed reports.

- 1906 - 214
- 1907 - 241
- 1908 - 243
- 1909 - 260
- 1910 - 260
- 1911 - 283
- 1912 - 263
- 1913 - 265
- 1914 - 266
- 1915 - 267
- 1916 - 270
- 1917 - 302
- 1918 - 321
- 1919 - 386
- 1920 - 407
ways to install them without bankrupting themselves.

Indications of a motor vessel lobby, whether formal or informal, appear in the repeated attempts of the Steamboat-Inspection Service to get authority at least to assure the minimum safety standards on such vessels. Because there were no serious disasters on motor vessels in which these inadequacies cost any great number of lives, the Supervising Inspector-General might just as well have been talking to a stone wall.

Corruption in lower levels was evidently rampant, from some of the indications. We note the findings of the inquiries after the GENERAL SLOCUM fire in which inspectors themselves were found very culpable. Grosvenor's statement about ships going to where inspection was most lax would tend to raise a question about the honesty of the execution of what laws there were. Inspector-General Uhler, on the other hand, appears to be more sincere than his field staff. However, in reading the quarter century of his reports, one cannot help but sense an air of futile pleading against odds.

But the question as posed is whether or not George Uhler left the inspection and safety of American steamers in any better state when he retired in 1925 than they had been in when the GENERAL SLOCUM burned. Our considered conclusion would be a conditional "yes". On paper, the
situation was comparatively excellent beside what it had been in 1904. But even with these improvements, the human errors or deliberate indifference to safe practice were enough to cause the MORRO CASTLE fire, or more recently the U. S. S. CONSTELLATION or MARINE SULPHUR QUEEN disasters.

Perhaps the best summary of the human factor in safety is made by Edmund A. Walsh, who besides being a marine expert, is a priest and probably more likely to be sensitive to this matter:

"No amount of inanimate equipment in steel, fireproofed wood or asbestos can replace leadership, clear thinking and iron in the souls of men." 14

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MANUSCRIPTS


