**A Brief Overview of the Marine Forensics Committee and Panel**

The formation of the Marine Forensics Panel began with a technical paper that William Garzke wrote in 1993 with Dana Yeager, Stewart Harris, Robert Dulin, and D. K. Brown concerning underwater submersibles for the September 1993 Annual Meeting of the Society of Naval Architects and Marine Engineers. This meeting was a centennial event for the Society and there were a number of attendees for this meeting in New York City. This paper featured a study of the development of underwater research vehicles, and featured how such vehicles were used in the explorations of the wrecks of *Titanic* and *Bismarck* to demonstrate what modern technology could accomplish with the advancements in underwater electronics and robot technology. The news media seized on the section of the paper concerned with *Titanic* and instantly William Garzke became a news item on 17 September 1993 in New York City. Television interviews were made with Dan Rather of CBS, Tom Brockaw of NBS, and Paula Zahn of CBS Good Morning America. The BBC scheduled a voice interview as well.

This event would be followed by a special meeting at the Oceans ’94 in Brest, France where William Garzke made a presentation on the *Titanic*. This opportunity was done with the invitation of Joseph Vadas of NOAA who had organized this meeting. William Garzke was introduced to Jean-Louis Michel, Paul Henri (PH) Nargeolet and George Tulloch of RMS Titanic, Inc., and Andre Sergovich (Russian MIR pilot). Dr. Ballard was invited to the meeting, but could not attend. It was after this meeting that Chairman Garzke petitioned SNAME to form a panel on marine forensics. Dr. William Morgan, who was chair of the Technical and Research Committee of SNAME, thought that this would be possible. Ultimately the Marine Forensics Committee was formed as an adhoc panel under the Ship Design Committee.

During 1994, Bill Garzke was invited for a special meeting with George Tulloch to acquaint him with the operations of RMS Titanic, Inc. and to discuss a Titanic Barge Project that Mr. Tulloch wanted to build to house artifacts taken from the debris field of RMS *Titanic*. He wanted Gibbs and Cox. Inc. to design this barge museum. Mr. Tulloch also pledged cooperation with the activities of the future Marine Forensics Panel.

The first meeting of the Marine Forensics Panel (SD-7) was called to order by Chairman Bill Garzke 2 March 1995 at the Washington, DC office of Gibbs and Cox. Paul Cojeen, who was not a member of the Panel, but interested in what the Panel’s intents would do was in attendance. He would make it clear that the Panel should not be involved in active shipwreck investigations. This was to avoid making SNAME becoming involved in any resulting lawsuits. Mr. Cojeen was informed that Panel SD-7 has two members that are involved in maritime law, David Davies and George Chandler, who are not only practicing attorneys, but also naval architects. The safest approach for the Panel to gain experience would be to investigate ship losses like *Titanic* and *Lusitania* which are well beyond the statutes of limitations.

Robert Scott, president of Gibbs and Cox and who was the sitting president of ASNE, addressed the group after introductions had been made. He wanted those in attendance to know that the American Society of Naval Engineers, supported the systematic study of marine forensics.

Chairman Bill Garzke appointed Robert Dulin to be the ASNE spokesman for the Panel and David K. Brown to be the spokesman for the Institution of Naval Architects. The latter appointment made Panel SD-7 truly international. Bob Dulin and Bill Garzke were to draft up the Panel’s charter for submittal to the Society of Naval Architects and Marine Engineers. David Davies (a maritime lawyer from Cleveland, Ohio was chosen to be the Panel’s secretary and take care of any legal issues that might arise. George Chandler of Hill, Rivkins, and O’Brien also joined the Panel to be an advisor on maritime law. Peter Hsu, Phil Sims, and Arthur (Sandy) Sandiford were also present at this meeting. A discussion took place concerning a paper entitled, “The *Titanic* and *Lusitania, A Final Forensics Analysis*, by William Garzke, David K. Brown, Arthur Sandiford, John Woodward, and Peter Hsu that was to be presented that evening at a meeting of the Chesapeake Section of the Society of Naval Architects and Maine Engineers. This would be the first technical paper presented by the Panel. Chairman Bill Garzke noted that there would be a press conference held at 4:10 PM with reporters from the Voice of America, the Public Broadcasting System, and Script-Howard News. The authors of the paper were Bill Garzke, David K. Brown, Arthur Sandiford, John Woodward, and Peter Hsu. That paper would be chosen for the Vice Admiral Cochrane Award for the best paper delivered before a Section of SNAME in 1995. The paper also would later be presented to the New York Metropolitan Section where I had been Section Chairman in September 1996.

 The second meeting of the Marine Forensics Panel took place on 22 June 1995. The charter for the Panel was approved. Important in the charter was the decision to drop the provision for listing of qualified marine forensics investigators. The eleven members attending decided that a listing of famous historical ship wrecks should be done for the next Panel meeting. It was during one of these early meetings that Mr. Gregg Bemis, owner of the wreck of the RMS Lusitania, joined the Panel. Chairman Bill Garzke announced that Dr. Ian Buxton and Mr. David K. Brown had become members of the Panel. David Brown was to represent the interests of the Royal Institution of Naval Architects (RINA)

 The Marine Forensics Panel Meeting of 6 June 1996 was very noteworthy in its history. The meeting was attended by Mr. Gregory Andorfer of Stardust Visual who was working with the Discovery Channel and RMS Titanic, Inc. on an expedition to the wreck site of *Titanic* during August 1996. Mr. Andorfer was interested in a finite element study of *Titanic* that would indicate where critical stresses occurred during her sinking process on 15 April 1912. Bill Garzke was chosen to be a technical consultant on a documentary that would feature testing of steel taken from the wreck site and be the program manager for Gibbs and Cox during the finite element study. Mr. Andorfer chose Dr. H. P. Leighly of the University of Missouri, Rola to do the metallurgical analyses. Funding for the *Titanic* project was done by Stardust Visual and the Society of Naval Architects and Marine Engineers. As part of this project, Mr. Garzke would go to the *Titanic* wreck side in 1996 would join with David Livingston of Harland and Wolff, Belfast as technical consultants to assist in the recovery of a steel section of *Titanic*.

In 1997 Chairman Bill Garzke, who was at that time a Vice President of SNAME and Chairman of the SNAME Education Committee as well as Chairman of the Marine Forensics Panel, attended an Executive Meeting of that Society in Jersey City, New Jersey. Chairman Garzke asked the Executive Committee whether the Society would allow the Marine Forensics Panel to make an independent investigation of the loss of MV *Estonia,* a Baltic Sea ferry that had been lost in a severe storm in that body of water in September 1994. The Panel had been contacted by an association of Swedish families that had lost family members in the disaster through the efforts of Gregg Bemis. The Executive Committee told Chairman Garzke that the Marine Forensics Panel could not participate in such an investigation due to liability constraints. Individuals could participate in such an investigation, but not under auspices of the Society. Shipwrecks that are no longer liability constraints such as *Titanic, Lusitania*, and *Andre Doria* could be Panel-sponsored projects.

In February 1998 Chairman Bill Garzke was invited to make a presentation on Marine Forensics to a Study of Forensics by the Smithsonian Society. This was the first time that the public had heard that there was such an endeavor.

As a continuing part of the *Titanic* project, Mr. Garzke would go to the wreck site in 1998. Chairman Bill Garzke would join with David Livingston of Harland and Wolff, Belfast as technical consultants in the recovery of a 20-ton section of Titanic and to confirm its location on the ship.. These efforts would result in two television documentaries, *Titanic Live* (August 1998) and *Titanic, Answers from the Abyss* in 1999. Panel members David Wood and Richard Silloway were part of the second team to advise on the identification of two inner bottom sections of the ship. In December 1998 the Panel participated in the sinking tests of a model of Titanic’s bow at the Naval Warfare Center, Carderock. These efforts would culminate in the editing of the script for a televised documentary at a special Panel meeting in January 1999 that would be aired on the Discovery Channel in April 1999. Further finite element studies were made that located peak stresses in the ship when it broke apart at the surface before making its plunge to the seabed below.The Discovery Channel’s production, *Titanic, Answers from the Abyss*, was an outstanding success. It was rated as the fourth best television documentary.

In 1998 the National Geographic Society requested the assistance of the Marine Forensics Panel in the loss of the USS *Maine* in Havana harbor in 1898. They were planning for an article that would commemorate the 100th anniversary of its loss. Nichols Advanced Marine was also contacted to study the loss of the ship and confirm whether a mine explosion was responsible for the loss. The need to do so was made necessary by a statement from Admiral Hyman Ricover that the cause of the loss was not a mine, but an internal explosion resulting from the spontaneous combustion of coal. The Marine Forensics Panel appointed a subcommittee of Robert Dulin, Phillip Sims, and Peter Hsu led by Chairman Bill Garzke to do the study. National Geographic provided testimony of the crew, plans of the ship, and a final report by the Department of the Navy in 1911. After some research and meetings, Panel SD-7 gave its report to the National Geographic Society that the cause of the explosion was the spontaneous combustion of coal near a magazine. Phillip Sims had also found that there had been 39 such incidents of spontaneous coal combustion in U.S. Navy ships during that period. Nicholls Marine concluded it was a mine explosion, but was refuted by its Vice President Otto Jons who did an independent study based on structural analysis that was confirmed by Peter Hsu who had studied photographs of the wreckage taken in 1909. Otto Jons would make several presentations of his findings after joining Panel SD-7, including the Marine Forensics Symposium in April 2012.

In August Chairman Bill Garzke was invited to be guest speaker at the Dorothy Killam Lecture Series to be held at the Dalhousie University in Halifax, Nova Scotia during October 1999. The Canada Council Killam Prizes were inaugurated in 1981 with a donation by Mrs. Dorothy J. Killam in memory of her husband, Izaak Walton Killam. The Killam Program at the Canada Council also includes the Killam Research Fellowships, which support scholars engaged in research projects of outstanding merit in the humanities, social sciences, natural sciences, health sciences, engineering and interdisciplinary studies within these fields. Dalhousie University selected the topic, *Spirits of the Mineral World*, and selected Chairman Bill Garzke to give a lecture on the scientific findings on *Titanic*.

During September of 1999, SNAME held its Annual Meeting in Baltimore, Maryland. The Panel held a meeting at the Hyatt Regency to discuss the Maryland Science Exhibit, the planning for which was well advanced. Over twenty persons took part in this meeting that involved Gregory Andofer, Chairman of the board at the Maryland Science Center and George Tulloch, president of RMS Titanic, Inc. During that meeting the Panel presented a technical paper on the loss of the USS *Yorktown* (CV 5) during the Battle of Midway in June 1942, Professor Jacques Hadler, who wrote the War Damage Report of this ship without the benefit of seeing the wreck, was in attendance. In April 2000, the Maryland Science Exhibit opened in Baltimore, Maryland with much public interest. The Exhibit continued for a period of 18 months before it went on a tour of five other cities in the United States.

During 2000 Gregg Bemis led the first private diving expedition along with Panel member Paul Mathias and Jutta Rabe to *Estonia* wreck site. This effort was done on his own initiative and without the assistance or official permission of the Marine Forensics Panel, due to official direction of SNAME. Samples of steel from the area of the *Estoni*a’s bow visor were taken and presented for scientific analysis. These metal fragments were analyzed by professional metallurgical laboratories in Britain, the United States, and Germany. All labs concluded that explosions had deformed the metal.

On 17 March 2005 the Swedish government authorized a study into the loss of *Estonia*, admitting that the ferry had engaged in the carriage of Russian military equipment before the fateful voyage. On 19 May 205 a pre-announcement was made by VINNOVA, a special commission set up by the Swedish government, for a study into the loss of *Estonia*. Requests for proposals was set for 1 July 2005 and these proposals would be due by 29 August. On 10 October 2005 these proposals would commence for evaluation for the selected parties who would then submit detailed proposals by 15 December 2005. On 31 January 2006, the Swedish Government would announce the successful bidder based on VINNOVA’s recommendations.

In a surprising request, John Graffman, the Program Manager of VINNOVA, requested a meeting with the Marine Forensics Panel at their scheduled meeting on 20 September 2005. The Panel had scheduled a technical paper, Marine Forensics, Historic Shipwrecks, Determination of Root Cause,” at Oceans 2005 Conference on 20 September in Washington, DC. In advanced of that presentation, selected members of the Panel met with Mr. Graffman on 19 September to discuss concerns of any investigation of *Estonia*. He was informed that SNAME had not sanctioned the Panel’s involvement in any study of the ferry’s loss. Mr. Graffman attended the presentation at the Oceans 2005 Conference as well as the official Panel Meeting that followed on the afternoon of 29 September where he would make a presentation on the intents and schedule of proposals submitted to VINNOVA.

On 27 September 2005 Panel member Gregg Bemis presented a paper with technical data at an *Estonia* symposium in Tallinn, Estonia. This public symposium had been organized by Helje Kaskel, a widow from the *Estonia* catastrophe. During this symposium several international experts, including Mr. Bemis, mentioned that the official report of the disaster did not expose the true causes of the vessel’s loss that claimed the lives of 852 persons. Ms. Jutta Rabe also discussed the evidence of explosions on the ship, a subject that has been censored in the mainstream media. The conclusion of this Symposium was that a new investigation needed to be done, but it was never authorized or funded. An official government report was eventually issued that engineered the cause of the sinking to be the result of the storm with no mention of the many inconsistencies in the public record. The governments involved have since proposed encasing the wreck in concrete or burying it by dumping sand to prevent divers from accessing the “Grave Site”. While protecting grave sites is a laudable motive, it is noted that no one has ever proposed this level of effort or expense, to deny access on any other shipwreck.

The Panel’s involvement in the losses of HMS *Hood* and DKM *Bismarck* came in 1991 when Panel member William Jurens participated in an expedition to their wreck sites at the invitation of Expedition leader David Mearns. This expedition was sponsored by Channel 4 of London, England. Some results of that expedition were presented in a technical paper. *A Marine Forensics Analysis of HMS Hood and DKM Bismarck* by William Jurens, William H. Garzke, Jr., Robert O. Dulin, Jr., Jon Roberts, and Richard Fiske, at the SNAME Annual Meeting in September 2002. Mr. Jurens was also asked to review some of the findings of the data from the May 2002 Expedition to the *Bismarck* wreck site by James Cameron. That led to a visit with Mr. Cameron by three Panel members (Bill Garzke, Ken Smith, and William Jurens) in August 2006 which led to a technical paper and presentation during ASNE Day 2008. Those meetings were crucial in the development of a book, Battleship Bismarck, A Design and Operational History to be published by the Naval Institute Press and Seaforth Publishing in November 2016.

Over the years that the Panel was active, studies of other ship losses were conducted. These included the losses of USS Maine (1998), HMHS *Britannic* (2002), MV *Beth Dee Bob* (2004), SS *Andrea Doria* (2008), HMS *Prince of Wales* (2009 and 2011), HMS *Hood* (2013), USS *Monitor* (2012), MV *Edmund Fitzgerald* (2012), and SS *Costa Concordia* (2012). In 2002, the Panel realized its first book publication, *"Titanic Ship’s, Titanic Disasters, An Analysis of Early White Star and Cunard Superliners"*; by William H. Garzke, Jr., and Professor John Woodward.

Co-Chairman Sean Kery joined the panel at the October 2007 meeting and became actively involved with the Panel’s development of the "Guidelines for Marine Forensic Investigations". When then editor Brian Abbott was rendered unable to participate due to an automobile accident, Sean took over as acting editor. The Guidelines document eventually grew to include 46 chapters and almost 700 pages encompassing every aspect of marine forensic investigations that authors could be found to write. It was published by SNAME as an E-Book in April 2012. The E-Book makes revisions and updates less expensive as there are no printing costs and no physical inventory. A second edition is in the planning stages at this time.

In June 2010, the Panel was established as a full SNAME Committee with Bill Garzke as it's first Chairman. Sean Kery would later become the vice chairman of the Committee and contribute much to marine forensics along with Kenneth Smith and Phil Sims. The Marine Forensics Committee began working on its first symposium to align with the 100th anniversary of the sinking of the RMS *Titanic* on April 15th, 1912, and to publish the Guidelines document. The Marine Forensics Symposium was held in April of 2012 and included more than 20 technical papers and presentations.

Members of the MFC have published one or more technical papers and presentations every years since the founding of the panel back in 1995. The Committee has many active members from SNAME, but we are unique in that we also welcome members of ASNE, MTS, RINA, IMRest and various other technical societies, as well as educators, shipwreck owners, divers, underwater archaeologists, US Coast Guard and NTSB investigators and even members of the general public, such as Pierette Simpson a survivor of *Andria Doria* who also published a book. *Alive on Andria Doria*. Ms. Simpson is an honorary member of the Marine Forensics Committee.

**Funding of Research:**

Over its 21 years of existence the Marine Forensics Panel/Committee has received funding to accomplish research into some the ship losses enumerated above.

*Lusitania* - SNAME Technical and Research (T&R) Committee awarded $1,000 to Jamestown Marine for as study of its sinking. Results of that paper were published in a paper on the loss of this ship by Peter Hsu and Bill Garzke to the New York Metropolitan Section in 1998.

*Titanic* - SNAME T&R Committee and Discovery Channel awarded $25,000 to perform a Finite Element Analysis (FEA) on the sinking stresses in the Titanic to Gibbs & Cox, Inc. This analysis was keen in locating the critical stressed areas of the ship.

HMS *Hood* - SNAME T&R Committee awarded $1,000 for the purchase of video tapes of the debris field of HMS hood in 2001. The analysis of those tapes is an ongoing task of the Marine Forensics Committee.

A list of Committee Papers grouped by topic follows:

Oceans “95, Presentation on *Titanic* by William H. Garzke, Jr.

*The Titanic and Lusitania, A Final Forensics Analysis*.- William Garzke, David K. Brown, Arthur Sandiford, John Woodward,, and Peter Hsu.

*The Loss of Titanic*, William H. Garzke, Jr. and David K. Brown. Titanic Symposium, Institute of Marine Engineers, Belfast Northern Ireland, April 15-16, 1997.

*The Titanic*, *An Anatomy of a Disaster*, William H. Garzke, Jr., David K. Brown, Paul Mathias, David Livingston, Dr. Timothy Foecke, Dr. Roy Cullimore, David Wood, Dr. H. P.. Leighly, and Arthur Sandiford, October 1997 Annual Meeting, (This Paper won the Joseph Linnard Prize for the Best Paper at this Annual Meeting)

*The Loss of RMS Titanic,* Spirits of the Mineral World, William H. Garzke, Jr. Dorothy Killum Lecture, Halifax, Nova Scotia, October 1999.

*A Marine Forensic Analysis of the RMS Titanic*, William H. Garzke, Jr. Dr. Timothy Foecke, Paul Mathias, and David Wood, Proceedings of Oceans 2000, Providence, Rhode Island.

*The Impact of Bioconcretious Structures (Rusticles) on the RMS Titanic*, Implications for Maritime Steel Structures, Dr. Roy Cullimore and Lori Johnston, November 2000 Annual Meeting.

*A Marine Forensics Analysis of the Titanic*, William H. Garzke, Jr., Timothy Foecke, Paul Mathias, and David Wood, October 2001 Annual Meeting.

*The Break-up of Titanic A Progress Report from the Marine Forensics Panel (SD-7)*, Roy F. Mengot, and Richard T. Woytowich, New York Metropolitan Section, The Society of Naval Architects and Marine Engineers, 2009.

*"Titanic Ship’s, Titanic Disasters, An Analysis of Early White Star and Cunard Superliners"*; Garzke, W. H. Jr., Woodward, J*.,* SNAME 2002

*Tumblehome Warships* – Philip J. Sims and James S. Webster, November 1996 Annual Meeting.

"Comparative Naval Architecture of Passenger Ship’s”, Sims, P., 2003 World Maritime Technology Conference, San Francisco,  October 2003 attendees hand out Compact Disk, also appeared as SNAME Transactions 2003 , Vol 111, SNAME, Jersey City New Jersey, 2004 (pg 23 3-258)

*The Loss of MV Derbyshire,* Dr. Douglas Faulkner, November 1998 Annual Meeting.

*The Loss of the USS Yorktown (CV 6),* William H. Garzke, Jr. Robert O. Dulin, Jr., and William Jurens.

*The Loss of the Beth Dee Bob*. William H. Garzke, Jr. and Captain Steve Gatto. October 2004 Annual Meeting.

*The Loss of the MV Estonia*, William H. Garzke, Jr., Ken Smith, and Gregg Bemis, September 2005, Oceans 2005.

Presentation, Loss of the *Andrea Doria*, William Garzke, Jr. and Pierette Simpson, Technical & Research Committee, SNAME, November 2006.

*The Loss of Andrea Doria*, William H. Garzke, Jr. and Pierette Simpson, New York Metropolitan Section, The Society of Naval Architects and Marine Engineers, 2008.

*The Decay of the Andrea Doria*, Philip Sims, John Moyer, Steve Gatto, Journal of Ship Production and Design, Vol.26, No.3, August 2010, pp187-198

 “*Alive on the Andrea Doria*”; Pierette Simpson 2008

*A Marine Forensics Analysis of HMS Hood and DKM Bismarck* – William Jurens, William H. Garzke, Jr., Robert O. Dulin, Jr., Jon Roberts, and Richard Fiske, September 2002 Annual Meeting.

*Presentation on the DKM Bismarck*, William H. Garzke, Jr., Robert O. Dulin, Jr., and William Jurens, Hampton Roads Section, The Society of Naval Architects and Marine Engineers, February 2008.

*The Wreck of DKM Bismarck, A Marine Forensics Analysis*, James Cameron, Robert O. Dulin, Jr., William H. Garzke, Jr., William Jurens, Kenneth M. Smith, Jr., Arlington, Virginia, American Society of Naval Engineers (ASNE Day, 2008), June 2008.

"*The Bismarck Encounter"*; Garzke, W. H. Jr., Dulin, R. O. Jr., Webb, T. G., Presented to the Chesapeake Section of the Society of Naval Architects and marine Engineers, June 5th, 1991

*The Loss of the HMS Prince of Wales*, William H. Garzke, Jr. Kevin Denlay, and , Robert O. Dulin, JOINT Meeting of the Institute of Marine Engineers and the Institution of Naval Architects, London, September 2009.

*The Loss of the HMS Prince of Wales*, William H. Garzke, Jr. Kevin Denlay, and , Robert O. Dulin, Jr., New York Metropolitan Section, The Society of Naval Architects and Marine Engineers, 2011.

*Structural Failures in Large Passenger Ships*, William H. Garzke, Jr., Annual Meeting of The Society of Naval Architects and Marine Engineers, 2012.

Jons, Otto P. “Remember the *MAINE”*

Mengot, R.F., Woytowich, R.T., “The Breakup of Titanic: A Progress Report from the Marine Forensics Panel (SD-7), Marine Technology, Vol. 47, No.1 January 2010, pp37-46

Polmar, N.,”The Death of the USS Thresher, The Story Behind Histories Deadliest Submarine Disaster”; Lyons Press, Guilford, CT, 1964, 2001, 2004

”A Forensic Investigation Of The Breakup And Sinking Of The Great Lakes Iron Ore Carrier *Edmund Fitzgerald*, November 10th 1975, Using Modern Naval Architecture Tools And Techniques, **Updates on the 40th Anniversary**”; Kery, S.M., to be Presented 12/15/2015 at SNAME Luncheon series by request.

“Naval Architecture of the USS Monitor”; part of the NOAA Monitor Project final report, 2016

Several chapters in preparation due September 2016. (deadline recently changed by NOAA)

"On the Hydromechanics of Vessels and Debris Fields During Sinking Events"; S. Kery,Paper Presented at SNAME World Technology Conference, November 2015 in Providence RI

“Weights Engineering of Historic Vessels: Sean Kery, SAWE International Symposium, Alexandria, VA, May 2015 **(Best Paper Prize)**

Hydrodynamics Related to Shipwreck Taphonomy”; Sean Kery, Jillana Stauffer,Paper Presented at MTS/IEEE Oceans 2015 in Washington DC.

Marine Technology Society Journal, November/December 2012 Issue on Marine Forensics, Guest editor and Author.

“Guidelines for Marine Forensics Investigations”; (Book, 46 chapters approx. 700 pages), Kery S. Editor and principle author (Chairmen MF-8 Panel / Editor) Published as SNAME T&R Bulletin 8-1, April 2012

”A Forensic Investigation Of The Sinking Of USS *Monitor* Using Modern Naval Architecture Tools And Technologies”; Kery, S., Eaton, M., Quigley, C., Hnderson, S., Broadwater, J., Johnston, J., Krop, D., Nordgren, E., Vada, T., 2012 International Marine Forensics Symposium, National Harbor MD, April 2012

”A Forensic Investigation Of The Breakup And Sinking Of The Great Lakes Iron Ore Carrier *Edmund Fitzgerald*, November 10th 1975, Using Modern Naval Architecture Tools And Techniques”; Kery, S.M., Fisher, B.; 2012 International Marine Forensics Symposium, National Harbor MD, April 2012 **(Winner 2012-13 CSC Best Papers Prize)**