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Engineering & Scientific Consulting

Patrick Hudson, Ph.D., P.E.

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Professional Profile

Dr. Hudson specializes in marine vessels, floating structures, and waterfront infrastructure. He applies his expertise to the investigation and analysis of naval and commercial vessels, recreational boats, ship repair, marine cranes, marine terminals and facilities, coastal engineering, subsea cables, industrial diving operations, and marine workplace safety.

Dr. Hudson's project experience includes reconstruction of commercial and recreational vessel accidents, analysis of vessel allisions and collisions, vessel grounding and sinking, stability analysis of vessels and barges, ship cargo securement and damage, seawalls, and operations related to drydocks and ship repair facilities. He has investigated marinas, residential and commercial piers and docks, vessel moorings and marine anchor systems, underwater vehicles, and waterfront construction.

Dr. Hudson has over 30 years of experience in naval architecture and ocean engineering, including vessel design, condition assessment, and failure analysis. He is a retired Commander and Engineering Duty Officer in the U.S. Navy, having served for a combined 26 years of active and reserve duty. His most recent service included several years in the Navy's ship repair and salvage communities, where he focused on heavy lift and drydocking of damaged vessels.

Dr. Hudson was an Assistant Professor of Naval Architecture and Ocean Engineering at the United States Naval Academy, as well as Lecturer at the Johns Hopkins University and Virginia Tech, where he taught undergraduate and graduate-level university courses in naval architecture, marine propulsion, ports & harbors, and offshore and coastal engineering.

Academic Credentials & Professional Honors

M.L.S., Legal Studies, Sandra Day O'Connor College of Law, ASU, 2022

Ph.D., Civil Engineering, Johns Hopkins University, 2002

M.S., Civil Engineering, Johns Hopkins University, 2001

B.S., Naval Architecture, United States Naval Academy, 1989

Tau Beta Pi Engineering Honor Society

Past President, Coasts, Oceans, Ports, & Rivers Institute of the American Society of Civil Engineers

Licenses and Certifications

Professional Engineer Mechanical, California, #38178

Professional Engineer, Maryland, #31148

Professional Engineer Mechanical, Texas, #128035

Professional Engineer, Virginia, #0402024913

Academic Appointments

Assistant Professor, Naval Architecture & Ocean Engineering, U.S. Naval Academy, 2005 - 2014

Adjunct Professor, Civil Engineering, The Johns Hopkins University, 2001 - 2014

Lecturer, Aerospace & Ocean Engineering, Virginia Tech, 2000 - 2014

Lecturer, Mechanical Engineering, U.S. Naval Postgraduate School, 1995

Prior Experience

Marine Practice Leader, Envista Forensics, 2019 - 2021

National Marine Division Manager, Rimkus Consulting Group, 2017 - 2019

District Manager and Forensic Engineer, Unified Investigations & Sciences, Inc., 2016 - 2017

Branch Head, U.S. Navy Pacific Fleet, Southwest Regional Maintenance Center, 2015 - 2016

Senior Naval Architect, Carderock Division, Naval Surface Warfare Center, 2009 - 2015

President and Principal Naval Architect, Moment Engineering, Inc., 2008 - 2015

Commander, Engineering Duty, Naval Sea Systems Command (NAVSEA), 1995 – 2015

Senior Professional Staff, Johns Hopkins University Applied Physics Laboratory, 2001 – 2009

Senior Naval Architect, Carderock Division, Naval Surface Warfare Center, 1996 – 2001

Project Naval Architect, John J. McMullen Associates, Inc., 1993 – 1996

Lieutenant, U.S. Navy Civil Engineer Corps, 1989 – 1993

Professional Affiliations

American Society of Civil Engineers (ASCE)

American Society of Mechanical Engineers (ASME)

Maritime Law Association of the United States (MLAUS)

Society of Naval Architects and Marine Engineers (SNAME)

Publications

Patev, Robert, Gary Consolazio, Patrick Hudson, Michael McCormick, Bill Marr, Johnny Walker, and Kent Hokens (2010), *Aberrant Barge Impact Loads on Hurricane and Storm Damage Risk Reduction system (HSDRRS) Floodwalls*, U. S. Army Corps of Engineers, North Atlantic Division, Technical Report, March 2010.

Hudson, Patrick, *Aground Upon the Sands: An Investigation into the Wave-Induced Migration of Grounded Ships*, VDM Verlag CDR Müller, Saarbrücken, Germany, ISBN: 978-3639139532, 2009, 212 pages.

Fredriksson, D.W., I. Tsukrov, and P. Hudson (2008) "Engineering Investigation of Design Procedures for Closed Containment Marine Aquaculture Systems," *Aquacultural Engineering*, Vol. 39 (2-3), November 2008, pp. 91-102.

McCormick, Michael and Patrick Hudson (2008), *Alternative Expression for Havelock's Free-Surface Integral*, U. S. Naval Academy, Engineering and Weapons Division, Report EW-01-08, January 2008.

Hudson, Patrick J., CAPT Jim Wilkins, Steve Quinn, Nigel Hills, Robert Wasalaski, and Emmanuel Ofosu-Apeasah, (2005) "Overcoming Interoperability Challenges for Joint and Coalition Heavy Lift Transportation Operations," *Proceedings of ASNE Day 2005*, American Society of Naval Engineers, Virginia Beach, Virginia, 25-27 April 2005.

McCormick, Michael E., David Kraemer, Patrick Hudson, and William Nobel (2002), *Analysis of the Added Mass of a Barge in Restricted Waters*, U.S. Army Corps of Engineers, Washington, D.C., ERDC/ITL TR-02-B.

Hudson, Patrick J., Michael E. McCormick, and Shannon T. Browne (2001), "A Low-Cost Wave-Sediment-Towing Tank," *Proceedings of the Fourth International Symposium on Ocean Wave Measurement and Analysis*, San Francisco, California, 3-5 September 2001.

McCormick, Michael E. and Patrick J. Hudson (2001), "An Analysis of the Motions of Grounded Ships," *International Journal of Offshore and Polar Engineering*, Vol. 11(2), pp. 99-105.

Hudson, Patrick J. (2000), *SICEM vs. ASSET: A Systematic Comparison*, Naval Surface Warfare Center, Carderock Division, Report No. NSWCCD-20-TR-2000/02.

Hudson, Patrick J. (1999), *Ship Integration Cost and Evaluation Model (SICEM)*, Naval Surface Warfare Center, Carderock Division, Report No. NSWCCD-26-TR-1999/09.

Project Experience

Dr. Hudson has investigated many vessel accidents, including sinking of a fishing vessel in California resulting in one fatality; sinking of a sailboat in Maryland resulting in two fatalities, sinking of a floating drydock while under tow off of California, fire that destroyed a large commercial vessel in Mexico, allision of a recreational fishing boat with an oil platform in Louisiana, and a collision between two vessels in the Houston Ship Channel. Other investigations included fatal accidents in civilian shipyards and aboard naval vessels during repairs, contamination of cargo tanks on a civilian barge, and unique hull corrosion on a river excursion vessel.

He has evaluated damage to marinas, floating docks, fixed docks, piers, and seawalls from vessel allisions, hurricanes, fires, tsunamis, and/or floods, including opining as to the specific cause of damage (e.g., wind vs. waves) and assessment of required repairs. Relevant projects have included a large petroleum pier in Panama significantly damaged by a ship allision, an inland recreational marina

destroyed by a tornado, a Gulf coast shipyard with two floating drydocks partially sunk by a hurricane, a seawall overtopped by large waves, and a major fire at a recreational marina that damaged the docks and destroyed several vessels.

Dr. Hudson has conducted numerous regular evaluations of piers, wharves, aids to navigation, floating docks, and other waterfront infrastructure at U.S. Coast Guard facilities nationwide. These inspections included both above and underwater evaluations of material condition, expected remaining service life, and recommended repairs. The underwater inspections were conducted by subcontracted divers using both surface-supplied air and SCUBA diving methods. Defects and deterioration of the structures were documented and compared with the previous inspection results.

While serving in the U.S. Navy, Dr. Hudson participated in multiple marine salvage operations, including the recovery of the turret from the Civil War ironclad U.S.S. Monitor in North Carolina and relocation of the wreck and recovery of bodies from the Japanese Fisheries Training Vessel Ehime Maru off of Hawaii. He supervised construction and repair of vessels in shipyards and floating drydocks, observed the onload and offload of naval vessels aboard float-on/float-off heavy lift ships, and conducted regular inspections of floating drydocks and graving docks. During his time with the Navy Seabees, he managed several naval facility construction projects, including landing and termination of submerged acoustic surveillance cables, construction of a ten-story residential tower, construction of a new security building, modernization of a sewage lift station, road paving, and installation of underground and above-ground utilities.

As a civilian naval architect, Dr. Hudson worked for over 20 years in the design, evaluation, modification, and repair of both naval and commercial vessels, including aircraft carriers, submarines, amphibious assault ships, cruisers, destroyers, oceanographic research vessels, and ferries. Major design programs included the CVX (later CVN-78) next generation aircraft carrier, the Virginia Class attack submarine, and the DDG-1000 destroyer. Dr. Hudson also served as the Deputy Technical Director of the Navy's Center for Innovation in Ship Design.