

SHIP STRUCTURE SYMPOSIUM 2000

WELCOMING COMMENTS

“SHIP STRUCTURES FOR THE NEW MILLENNIUM:
SUPPORTING QUALITY IN SHIPBUILDING”

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June 13, 2000

INTRODUCTION:

CAPT VANHAVERBEKE, MR. ASHE.

GOOD MORNING AND WELCOME TO THE SHIP STRUCTURE SYMPOSIUM 2000. I AM ADMIRAL BOB NORTH, U.S. COAST GUARD ASSISTANT COMMANDANT FOR MARINE SAFETY AND ENVIRONMENTAL PROTECTION, AND CHAIRMAN OF THE SHIP STRUCTURE COMMITTEE.

I TAKE GREAT PRIDE IN WELCOMING EVERYONE HERE TO THE TRIENNIAL SHIP STRUCTURES SYMPOSIUM SPONSORED BY THE SHIP STRUCTURE COMMITTEE, THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS, AND THE

AMERICAN SOCIETY OF NAVAL ENGINEERS. I AM EQUALLY PLEASED TO HOST A SYMPOSIUM THAT ADDRESSES A VARIETY OF CONCERNS WITHIN THE MARITIME INDUSTRY.

THE INTER-AGENCY SHIP STRUCTURE COMMITTEE BEGAN OVER FIFTY YEARS AGO AS A BOARD OF INVESTIGATION INTO THEN UNEXPLAINED FRACTURES IN LIBERTY SHIPS.

ONE OF THE BOARD'S FINAL RECOMMENDATIONS WAS THE ESTABLISHMENT OF AN ORGANIZATION TO FORMULATE AND COORDINATE RESEARCH IN MATTERS PERTAINING TO SHIP STRUCTURES. THAT ORGANIZATION IS THE SHIP STRUCTURE COMMITTEE.

TODAY, THE SHIP STRUCTURE COMMITTEE COMPRISES REPRESENTATIVES FROM SEVEN MEMBER AGENCIES AND TWO PARTNER ORGANIZATIONS. THE MEMBER AGENCIES ARE:

AMERICAN BUREAU OF SHIPPING

DEFENCE RESEARCH ESTABLISHMENT ATLANTIC

MARITIME ADMINISTRATION

MILITARY SEALIFT COMMAND

NAVAL SEA SYSTEMS COMMAND

TRANSPORT CANADA

UNITED STATES COAST GUARD

THE SHIP STRUCTURE COMMITTEE HAS ALSO ESTABLISHED
FORMAL PARTNERSHIPS WITH SNAME AND THE GULF
COAST REGION MARITIME TECHNOLOGY CENTER.

IN ITS FIRST FIFTY YEARS, THE SHIP STRUCTURE COMMITTEE
HAS SPONSORED RELEVANT RESEARCH INITIATIVES
RESULTING IN OVER 400 PUBLISHED REPORTS, COVERING
A VARIETY OF ISSUES AFFECTING THE MARITIME
INDUSTRY.

THERE ARE THOSE WHO WOULD SAY THAT THE STRUCTURE
PROBLEM HAS BEEN SOLVED, AND WE NO LONGER NEED

THE WORK OF THE SHIP STRUCTURE COMMITTEE. I DON'T
AGREE. WE FACE EVER EVOLVING CHANGES, RISKS AND
CHALLENGES AS WE PURSUE IMPROVED MARITIME
SAFETY AND MARINE ENVIRONMENTAL PROTECTION.

THIS WAS ONE OF THE THOUGHTS A FEW YEARS AGO WHEN THE SSC REDEFINED ITSELF FOR THE SECOND TIME IN A DECADE. THE REDEFINED SHIP STRUCTURE COMMITTEE HAS A BROADER OUTLOOK, WHICH IS CRITICAL TO THE EFFORTS OF THE MEMBERS TO MEET THE DEMANDS FOR EVER INCREASING SAFETY IN SHIPPING, WHILE ADDRESSING THE SOMETIMES COMPETING DEMANDS FOR COST EFFECTIVENESS.

THE REDEFINED SSC WILL BETTER SERVE THE NEEDS OF THE MARITIME INDUSTRY AND EXPLORE NON-TRADITIONAL APPROACHES TO SOLVING TRADITIONAL PROBLEMS IN SHIP STRUCTURES.

THE MISSION OF THE SHIP STRUCTURE COMMITTEE IS TO
ENHANCE THE SAFETY OF LIFE AT SEA, PROMOTE
TECHNOLOGY AND EDUCATION ADVANCEMENTS IN
MARINE TRANSPORTATION, AND TO PROTECT THE
MARINE ENVIRONMENT.

THIS WILL BE DONE THROUGH ADVOCATING, PARTICIPATING
IN, AND SUPPORTING COOPERATIVE RESEARCH AND
DEVELOPMENT IN STRUCTURAL DESIGN, LIFE CYCLE RISK
MANAGEMENT OF MARINE STRUCTURES, AND
PRODUCTION TECHNOLOGIES.

I BELIEVE THIS MISSION IS REFLECTED IN THE THEME FOR THIS
YEAR'S SYMPOSIUM, "SHIP STRUCTURES FOR THE NEW
MILLENNIUM: SUPPORTING QUALITY IN SHIPBUILDING."

THE SYMPOSIUM CO-CHAIRMEN, MR. GLENN ASHE OF ABS AND
CAPTAIN MARK VANHAVERBEKE OF THE U.S. COAST
GUARD, HAVE ORGANIZED A PROGRAM WHICH FEATURES

SIGNIFICANT PRACTICAL AND INSIGHTFUL WORKS THAT
ADDRESS FOUR SEPARATE THEMES:

RELIABILITY AND RISK METHODOLOGIES

HUMAN ELEMENTS IN SHIP DESIGN

CRASHWORTHINESS OF SHIP STRUCTURES

EMERGING OPPORTUNITIES.

YOU WILL NOTICE THAT A COUPLE OF THE THEME AREAS IN

THE PROGRAM ARE NOT PURE STRUCTURAL TOPICS.

THESE ARE RELIABILITY AND RISK METHODOLOGIES AND

THE ROLE OF THE HUMAN ELEMENT IN SHIP DESIGN.

THESE THEME AREAS, COMBINED WITH THE TRADITIONAL

STRUCTURAL THEMES, REFLECT THE EXPANDED SCOPE

OF THE SHIP STRUCTURE COMMITTEE TO MEET THOSE

EVER EVOLVING CHANGES, RISKS AND CHALLENGES I

MENTIONED EARLIER.

LET ME GIVE YOU A FEW EXAMPLES OF THE TYPES OF RESEARCH NOW BEING CONDUCTED BY THE SSC. AS I DO, YOU MAY NOTE THAT THEY INTEGRATE WELL WITH THE THEME OF THIS SYMPOSIUM.

ON CRASHWORTHINESS, ONE CURRENT SSC PROJECT EXPLORES ANALYTICAL MODELS FOR STRUCTURAL PERFORMANCE OF SHIPS IN GROUNDINGS AND COLLISIONS.

THERE IS ALSO A CURRENT SSC PROJECT ON THE RELIABILITY OF WATERTIGHT BOUNDARIES. THE OBJECTIVE OF THIS RESEARCH IS TO ASSESS THE STRUCTURAL RELIABILITY OF THE DECKS AND BULKHEADS FORMING WATERTIGHT BOUNDARIES OF VITAL SPACES AND DEVELOP STRUCTURAL DESIGN CRITERIA THAT WILL PROVIDE A LEVEL OF RELIABILITY THAT IS CONSISTENT WITH DAMAGED STABILITY CRITERIA.

BUNKER SPILLS AND THE PROTECTION OF BUNKER TANKS
HAVE RECENTLY BECOME HIGHLY VISIBLE ISSUES.
ANOTHER CURRENT SHIP STRUCTURE COMMITTEE
PROJECT ASSESSES THE RISK OF OIL SPILLS FROM BUNKER
TANKS IN THE EVENT OF COLLISION OR GROUNDING.
THIS PROJECT WILL ADDRESS BUNKERS ON TANKERS,
CARGO SHIPS, AND CONTAINERSHIPS AND EVALUATE
DESIGN ALTERNATIVES FOR MITIGATING THIS RISK.

FOR THOSE OF YOU IN INDUSTRY, I RECOMMEND THAT YOU
LOOK AT THIS ISSUE CLOSELY. CONCERN IS HEIGHTENED
FURTHER BY THE AMOUNT OF BUNKERS CARRIED BY
LARGE CARGO SHIPS IN THIS POST PANAMAX ERA AND
THOSE EVEN LARGER SHIPS ENVISIONED FOR THE
FUTURE.

A FEW OF THE RECENTLY PUBLISHED SSC REPORTS ALSO
COINCIDE WITH THE SYMPOSIUM THEME AREAS. SSC 407
“OPTIMAL STRATEGIES FOR INSPECTION OF SHIPS FOR
FATIGUE AND CORROSION DAMAGE” AND SSC 408
“DETENTION PROBABILITY ASSESSMENT OF VISUAL
INSPECTION OF SHIPS” BOTH DELVE INTO RISK
MANAGEMENT AND HUMAN FACTORS.

WHAT IS THE U.S. COAST GUARD DOING WITH REGARD TO
MARITIME SAFETY AND ENVIRONMENTAL PROTECTION?
WELL, SEVERAL ISSUES UNDER CONSIDERATION WITHIN
THE COAST GUARD INCLUDE THE ADVENT OF LARGER
CRUISE SHIPS AND THE RISK MAJOR OIL SPILLS.

EMERGENCY EGRESS IS AN IMPORTANT CONSIDERATION ON PRESENT-DAY PASSENGER VESSELS. WITHIN FIVE TO TEN YEARS, WE WILL SEE CRUISE SHIPS WITH A 6000 PASSENGER CAPACITY. THE POSSIBILITY EXISTS FOR EVEN LARGER VESSELS WITH AN 8000 PASSENGER CAPACITY.

THE LARGE NUMBER OF PASSENGERS HEIGHTENS THE CRITICAL CONSIDERATION OF TIMELY EGRESS AND SAFE HAVENS. THE THREAT OF TERRORIST ATTACKS AND CRIMINAL ACTIVITY ALSO INCREASE ON THESE VESSELS.

WITH REGARD TO THE PREVENTION AND MITIGATION OF OIL SPILLS, MUCH OF OUR ATTENTION WAS PRIMARILY FOCUSED ON OIL TANKERS. NOW WE ARE TURNING OUR ATTENTION TO OTHER SOURCES OF OIL SPILLS.

I HAVE ALREADY MENTIONED THE WORK SPONSORED BY THE SSC ON THE PROTECTION OF BUNKER TANKS, BUT IN ADDITION TO BUNKERS, WE MUST ALSO CONSIDER THE RISK OF OIL SPILLS FROM OTHER SOURCES, SUCH AS OFFSHORE FACILITIES LIKE FDSO'S.

WHERE DO WE ALL FIT IN TO THIS PROCESS. WHAT'S OUR ROLE? RISK MANAGEMENT, HUMAN FACTORS, CRASHWORTHINESS, AND NEW TECHNOLOGIES ARE AREAS WHERE WE AS DESIGNERS, MANUFACTURES, AND REGULATORS CAN HAVE AN IMPACT ON MARITIME SAFETY.

THOSE OF US IN THIS ROOM PLAY ESSENTIAL ROLES IN THESE AREAS WITH A GREAT IMPACT ON MARITIME SAFETY AND ENVIRONMENTAL PROTECTION. WE IN GOVERNMENT AND STANDARD SETTING ORGANIZATIONS PROVIDE THE MINIMUM LEVEL OF STANDARDS TO WHICH SHIPS MUST BE BUILT, MANNED, AND OPERATED.

THOSE THAT DESIGN, BUILD, AND OPERATE SHIPS USE THOSE STANDARDS AS A BASELINE, BUT NEED TO LOOK BEYOND THEM IN ORDER TO REACH HIGHER EFFICIENCIES. BOTH GROUPS MUST FULLY EVALUATE THE EFFECTS OF THEIR ACTIONS SYSTEMATICALLY. LET ME PROVIDE YOU WITH SOME EXAMPLES.

IT IS ABSOLUTELY ESSENTIAL THAT WE BECOME MORE ADEPT AT SYSTEMATICALLY IDENTIFYING AND QUANTIFYING RISK. A RISK-BASED APPROACH IS CRITICAL TO ACHIEVING A HIGHER DEGREE OF MARINE SAFETY AND ENVIRONMENTAL PROTECTION WITHIN AVAILABLE RESOURCE CONSTRAINTS AND WITHOUT STIFLING COMPETITION AND INNOVATION.

BY BETTER QUANTIFYING RISK, WE WILL BE BETTER ABLE TO EVALUATE THE EFFECTIVENESS OF COMPETING DESIGNS IN BOTH PREVENTING ACCIDENTS AND MINIMIZING THE CONSEQUENCES.

THE OIL POLLUTION ACT OF 1990 HAS BROUGHT US DOUBLE HULL TANKERS. A LONG-STANDING PROBLEM WITH TANKERS IN GENERAL IS HOW TO EFFECTIVELY INSPECT AND MAINTAIN THEM.

THE WORLD'S TANKER FLEETS ARE IN THE PROCESS OF REBUILDING IN ORDER TO CONFORM TO DOUBLE HULL STANDARDS. AS WE DO SO, IT SHOULD BE STANDARD TO DESIGN IN AN EFFECTIVE MEANS TO CLEAN, INSPECT, AND MAINTAIN THESE SHIPS. THIS IS A PRIME EXAMPLE OF THE ROLL OF THE HUMAN ELEMENT IN MARITIME SAFETY. ONE OF THE PAPERS TO BE PRESENTED THIS AFTERNOON WILL ADDRESS THIS ISSUE.

CRASHWORTHINESS IS AN AREA WHERE LONG TERM COST SAVINGS CAN BE ACHIEVED THROUGH ACCIDENT MITIGATION. SOMETIMES, THE SYSTEM FAILS IN SPITE OF ALL EFFORTS TO ENSURE SAFE TRANSPORTATION. WE CAN DESIGN SHIPS TO SURVIVE THOSE TIMES, OR AT LEAST REDUCE THE NEGATIVE IMPACT.

OUR DESIGN STANDARDS SHOULD ALSO CONSIDER
CRASHWORTHINESS IN CONJUNCTION WITH DAMAGE
STABILITY. RESEARCH IN CRASHWORTHINESS INCLUDES
INVESTIGATION OF THE HULL RESPONSE TO COLLISION
AND GROUNDING ACCIDENTS, RESIDUAL STRENGTH, AND
OIL OUTFLOW.

ALL OF THESE ISSUES COME TOGETHER AS WE LOOK AT
EMERGING TECHNOLOGIES. HIGH-SPEED CRAFT PRESENT
NEW CHALLENGES IN STRUCTURAL DESIGN. RISK
MANAGEMENT COUPLED WITH THE ROLE OF THE HUMAN
ELEMENT IS ESSENTIAL FOR THE SAFE OPERATION OF
HIGH-SPEED CRAFT WHEN CONSIDERING FACTORS SUCH
AS VESSEL TRAFFIC IN CONGESTED PORTS.

CONCLUSION:

WHERE DO WE GO FROM HERE? AS I ALLUDED TO EARLIER, WE MUST CONSIDER RISK MANAGEMENT AND THE ROLE OF THE HUMAN ELEMENT AS KEY TO THE LONG-TERM WELFARE OF ANY SHIP, AND DESIGN THE SHIP ACCORDINGLY. WE MUST TAKE ADVANTAGE OF NEW TECHNOLOGY, INCLUDING ADVANCES IN CRASHWORTHINESS, AND ALSO APPLY PROVEN METHODS TO NOVEL AND FUTURE DESIGNS.

RECENT CASUALTIES, INCLUDING THE TANKER *ERICA* AND THE HIGH-SPEED CRAFT *SLEIPNER*, HAVE DEMONSTRATED THAT WHAT CAN GO WRONG, WILL. THE CHALLENGE TO NAVAL ARCHITECTS IS TO REDUCE THE PROBABILITY THAT SOMETHING WILL GO WRONG, AND, IN THE EVENT THAT IT DOES, REDUCE THE CONSEQUENCES.

WITH EACH OF US TAKING A STEP UP, WE WILL ESSENTIALLY
FORCE EVERYONE TO A HIGHER LEVEL IN SHIP DESIGN
AND BUILDING AS WE BEGIN A NEW MILLENNIUM.

ONCE AGAIN, WELCOME, AND I LOOK FORWARD TO AN
INFORMATIVE SYMPOSIUM.