O/DCI/alpha

25 October 1977

MEMORANDUM FOR: Director of Central Intelligence

FROM : Herbert E. Hetu
Assistant for Public Affairs

SUBJECT : DCI's Appearance Before Georgetown Visitation Students

REFERENCE : DCI Scheduling Item Sheet from [redacted] STA

1. Action Requested. Your approval to greet approximately 40 Georgetown Visitation students in a "Problems of Democracy" class and take questions for 10-15 minutes.

2. Background. This is a class of high school students from Georgetown Visitation Preparatory School for girls. You have agreed to meet with them. I propose to schedule you first and then provide them a half hour general briefing on intelligence by [redacted] the Agency's senior briefer. The session will be held in the DCI Conference Room. The class has given us three dates: 13, 15 or 20 December. We will arrange the date and hour in accordance with your calendar.

AT

STA

[redacted]
Herbert E. Hetu

Attachment
Reference

APPROVED: /s/ Stansfield Turner
Director of Central Intelligence

DISAPPROVED: _____
Director of Central Intelligence

DATE: 31 OCT 1977

(EXECUTIVE REGISTRY FILE O/D.C.I/alpha)

Next 5 Page(s) In Document Exempt

Approved For Release 2004/03/15 : CIA-RDP80M00165A002400070001-1

STA

31 October 1977

Executive Registry
77-2696

Mr. Douglas P. Bennett
Attorney at Law
1776 F Street, Northwest
Washington, D. C. 20006

Dear Doug,

Thank you for your thoughtful letter of 18 October. We are delighted you have decided to stay in this area.

Although I have the same job you remember my having, I miss my periodic trips to the White House to compare notes with you. We often look back on the "Bush Era" here with a certain amount of nostalgia. Incidentally, he sends me a note from time to time...mostly concerned with qualified people he has bumped into who have an interest in the Agency.

A mutual friend told us that George's profile will emerge prominently on the national political scene in the months ahead. You can bet Jan would welcome volunteer work for George Bush at the drop of a hat.

Thanks for writing.

Sincerely,

[redacted]

STA

B. C. Evans

BCEvans:sk
1 - ER
1 - ES

(EXECUTIVE REGISTRY FILE ODCI)

Douglas P. Bennett
Attorney at Law
1776 F Street, Northwest
Washington, D. C. 20006

October 18, 1977

Mr. Ben Evans

AT [redacted]

Dear Ben,

After leaving the White House and having had a wonderful opportunity to become "reacquainted" with Sandi and our children, including the happy arrival of twin daughters in May, I began practicing law this summer here in Washington. A friend of mine, [redacted] who has been practicing here for a number of years, and I have worked out an informal relationship which we hope will develop and grow as time passes. It's a pretty exciting thing for me and I'm plugging away to bring about good results. STA

I trust life is happy and full of gratification for you. I've certainly appreciated our friendship and look forward to strengthening it in the years ahead.

Best regards.

Sincerely,

Douglas P. Bennett

P.S. We anticipate moving into new offices about the turn of the year, but in the meantime I can be reached at [redacted] STA

You were a super help to us and I really appreciate it. My best to your wife.

Next 18 Page(s) In Document Exempt

Approved For Release 2004/03/15 : CIA-RDP80M00165A002400070001-1

AIAA/SNAME Advanced Marine Vehicles Conference

(With the cooperation of the U.S. Navy)

Sheraton Inn—Airport
San Diego, Calif.
February 25-28, 1974

The Advanced Marine Vehicles Conference to be held at the Sheraton Inn-Airport, San Diego, Calif., February 25-28, 1974, is jointly sponsored by the American Institute of Aeronautics and Astronautics and the Society of Naval Architects and Marine Engineers, with the active cooperation and support of the United States Navy. The AIAA is the administrative sponsor.

The conference will be a significant milestone in the development of advanced marine vehicles, bringing together the pioneers in each type of the emerging vehicles. Researchers, designers, and users, both commercial and military, will present and discuss the many recent technical advances, as well as their future plans, hopes, and fears in this challenging field.

The Program Committee has made an excellent selection of technical papers, providing a program of breadth and depth, and a high standard is assured for each of the six technical sessions. Vice Admiral Frank H. Price, Jr., will be the keynote speaker at the banquet. Another highlight of the conference will be the after-dinner panel discussion by a select group of policy-makers representing both industry and the Navy.

A number of advanced marine vehicles, including the Hydrofoil U.S.S. FLAGSTAF and the Navy XR-1C Surface Effect Ship, will demonstrate their capabilities and be available for inspection. The achievements and capabilities of the leading companies working in the field of advanced marine vehicles will be presented in the static exhibition, extending over the full 3-1/2 days. Arrangements are being made to provide a program of varied and interesting activities for the ladies.

W. J. EGGINGTON
General Chairman

Registration

Conferees must register in the Toledo Room of the Sheraton Inn-Airport and receive badges. The registration fees are:

AIAA/SNAME/U.S. Navy San Diego Sections members $10.00
Other AIAA/SNAME/U.S. Navy members, local nonmembers, authors, and other program participants $25.00
Nonmembers (nonlocal) $40.00
Student members ..... None
Student nonmembers $5.00

Registration will begin on Sunday, February 24, from 4:00 PM to 7:00 PM and will reopen the days of the meeting at 8:00 AM.

Hotel Reservations

AIAA has reserved a block of rooms at the Sheraton Inn-Airport, 1590 Harbor Island Drive, San Diego, Calif. 92101; telephone (714) 291-6400. The rates are $19.00 for Singles and $24.00 for Doubles and Twins. Please specify the name of the meeting as well as the date and time of arrival and departure when making room reservations. The rooms will be held until three weeks before the meeting and then released for use by the general public.

Banquet

The banquet on Tuesday will be held in the Madrid Room. The tickets are $10.00 each and may be purchased at the meeting.

Speakers' Briefings

Authors who are presenting papers, session chairmen, and coordinators will meet for a briefing on the day of their session. The briefings will be held at 8:15 AM in the Madrid Room. Coffee and rolls will be available.

Technical Papers

Separate copies of the papers can be purchased at the meeting at $1.00 each. The sales desk will be open during the registration hours. Technical papers also can be purchased from AIAA after the meeting at $1.50 each to members and $2.00 each to nonmembers.

Message Center

Incoming calls to conferees should be directed to (714) 291-6400. Messages will be recorded and passed on to the person by means of an information bulletin board. It will not be possible to page conferees.

Conference Committee

General Chairman
WILFRED J. EGGINGTON
Chairman, High Speed Surface Craft Panel, SNAME
Rohr Industries, Inc.

Technical Co-chairmen
CAPT. HENRY P. RUMBLE, USN (Ret.)
Scripps Institution of Oceanography
NILS SALVESEN
Naval Ship Research and Development Center

Navy Sponsor
CAPT. EUGENE H. MOYER, USN
Naval Material Command

Vehicle Demonstration Chairman
ROBERT H. KRIDA
Naval Air Systems Command

Exhibits Chairman
J. ROBERT DOUDNA
American Institute of Aeronautics and Astronautics

Administration Co-chairmen
JOHN ANGLES
National Steel and Shipbuilding Co.
MORRIS LEBOVITS
Global Marine Engineering Co.

Session Chairmen

Aircraft/Vehicle Interface Problems
ADM. JAMES S. RUSSELL, USN (Ret.)

Hydrofoil Craft
C. THOMAS RAY
The Boeing Co.

Surface Effect Ships
RADM. NATHAN SONENSHEIN, USN
Naval Material Command

Small Waterplane Area Twin Hull Ships
SIDNEY HERSH
Consultant

Amphibious Surface Effect Vehicles
JAMES L. SCHULER
Naval Ship Systems Command

Technology Advancement
RADM. ROBERT C. GOODING, USN
Naval Ship Systems Command

PROGRAM OUTLINE

Advanced Marine Vehicles Conference

MONDAY/FEBRUARY 25

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9:00 AM	Welcome	95
	The Aircraft/Advanced Marine Vehicle Interface	95
2:00 PM	Hydrofoil Craft	96
6:30 PM	Hosted Cocktail Party (Exhibition Room)	

TUESDAY/FEBRUARY 26

9:00 AM	Surface Effect Ships	97
1:30 PM	Advanced Marine Vehicles and Radio-Controlled Model Demonstrations	97
6:00 PM	No-Host Cocktail Party	98
7:30 PM	Banquet—Speaker: VADM Frank H. Price, Jr.	98

WEDNESDAY/FEBRUARY 27

9:00 AM	Amphibious Surface Effect Vehicles	98
2:00 PM	Small-Waterplane-Area Twin-Hull Ships	99
8:00 PM	Panel Discussion: The Future of Advanced Marine Vehicles	100

THURSDAY/FEBRUARY 28

9:00 AM	Technology Advancement	100

Note: All functions will be held in the Madrid Room of the Sheraton Inn-Airport Hotel, San Diego, Calif.

Sunday/February 24

4:00 PM to 7:00 PM/Toledo Room
Sheraton Inn-Airport

REGISTRATION

Conferees are urged to register during this time in order to avoid delays the first day of the meeting.

Monday/February 25 *9:00 AM/Madrid Room*

WELCOME

WILFRED J. EGGINGTON, General Chairman

THE AIRCRAFT/ADVANCED MARINE VEHICLE INTERFACE

Chairman: ADM. JAMES S. RUSSELL, USN, (Ret.), Tacoma, Wash.

(74-300) **Conceptual Options for Future Aircraft-Ship Operations.** J. J. MULQUIN, Naval Air Systems Command, Washington, D.C.

Mounting new pressures are forcing naval aviation away from classic equipment, tactics, and procedures that have characterized it for some 50 years. They include cost, manning, performance, and a host of factors relating to the Navy's future role in over-all national policy. These dynamic shifts in emphasis introduce, simultaneously, challenges to be overcome and opportunity to be exploited. This discussion explores developing Navy air mission alternatives and attempts to establish logical and practical links with advanced marine vehicle technology, relationships that bear directly upon the composition, character, and quality of the Air Navy in the crucial 1980's.

(74-301) **Wind Modification over the Flight Decks of High-Speed Ships.** R. D. MURPHY, Naval Ship Research and Development Center, Bethesda, Md.

This paper examines the effect of utilizing an aerodynamic shield for flight operations aboard high-speed ships. As an adjunct to another flight environment analysis, a brief investigation was made of a flow shield which decreased the local deck wind by 50%—90%. A porous shield installed on an unusual ship configuration was examined in a wind tunnel. Although flow visualization techniques revealed an exceedingly turbulent wake, velocity measurements define a large deck space where kinetic energy levels are compatible with current operational procedures. The results are correlated to flight experience and to further development.

(74-302) **Simulation of the Landing and Take-Off of a VTOL Aircraft on a Ship in a Random Sea.** J. C. GEBHARDT and G. H. DAFFER, CADCOM Inc., Annapolis, Md.

(74-303) **A New Aircraft/Ship Mating System.** KEN DeBOOY, Boeing Aerospace Co., Seattle, Wash.

Boeing studies of high performance vertical takeoff fighters designed to operate from small ships not equipped with catapults and arresting gear indicate that the tail sitter is the most efficient interceptor. The tail sitter fighter minimized weight and geometry problems associated with making all the thrust available for both the takeoff and the mission. Intercept and air-to-air combat missions require takeoff thrust to takeoff weight ratios consistent with vertical takeoff requirements. This paper deals with our approach to the serious problem of providing shipboard compatibility for this type of fighter.

(74-304) **The Design Application of Aircraft Securing and Traversing Systems to the Surface Effect Ship.** C. A. TOGHE, Navy Combat Systems, Litton Data Systems Div., Van Nuys, Calif.

The use of aircraft (VTOL) and helicopter on a surface-effect ship poses problems because of ship motions, high heave distances, and high operating relative wind. The unusual environment has forced new design to meet the requirements of operations, yet existing designs suitable for application impose a severe penalty in weight and ship layout. To formulate a design for an A/C securing and traversing system, analytic studies and design studies were performed. The system so designed is described in this paper, and the criteria and parameters leading to this selection are discussed in detail. The rejection of helicopter haul-down also is discussed.

(74-305) **Aircraft/Ship Interface Problems; The U.S. Navy's Program.** COMDR. J. R. SMITH, Naval Air Systems Command, Washington, D.C., and W. S. MITCHELL, Washington Technological Associates Inc., Rockville, Md.

The goal of the U.S. Navy Helicopter Compatibility Program is to provide adequate and proper aviation facilities in support of helicopter missions. The aviation facility involves visual landing aids, deck structure, communications, navigational aids, mooring aids, safety equipment, servicing, and maintenance interface areas. Development of optimum interface areas is dependent on comparing aircraft aerodynamic capability with ship requirements, matching aircraft servicing and maintenance requirements with ship capabilities, determining the impact of aircraft safety requirements on the ship facility, and matching mission reliability of both the ship and the aircraft. Careful consideration of these interface areas during the design phase can insure an effective intergration of aircraft and ship.

Monday/February 25 *2:00 PM/Madrid Room*

HYDROFOIL CRAFT

Chairman: C. THOMAS RAY, Boeing Aerospace Co., Seattle, Wash.

(74-306) **Hydrofoil Development—Issues and Answers.** WILLIAM M. ELLSWORTH, Naval Ship Research and Development Center, Bethesda, Md.

The U.S. Navy has been actively engaged in the development of hydrofoil ships and craft since the late 1940's. During this period, a number of controversial design issues have been addressed by analyses, model experiments, subsystems tests, and full-scale trials of several experimental prototypes. This paper examines some of the central technical issues in retrospect and sets forth conclusions derived from development efforts. Some of the issues discussed include: surface-piercing vs. submerged foils; canard vs. conventional strut-foil configurations; retractable vs. fixed foil systems; flap vs. incidence control; analog vs. digital autopilots; platforming vs. wave contouring; flat vs. banked turning; waterjet vs. propeller propulsion; and material selection.

(74-307) **High Speed and U.S. Navy Hydrofoil Development.** DAVID A. JEWELL, Naval Ship Research and Development Center, Bethesda, Md.

Beginning with the history of speeds achieved by hydrofoils worldwide, this account deals with recent results of the U.S. Navy Advanced Development Program. This program has gathered information on platform performance and operational demonstrations from the HIGH POINT (PCH-1), PLAINVIEW (AGEH-1), FLAGSTAFF (PGH-1) and TUCUMCARI (PGH-2). Recent developments in hydrofoil platform technologies cover automatic control systems, propulsion and auxiliary machinery, strut-foil, and hull subsystems. Operations cover total operational and foilborne times, transit distances, debris collisions, mission equipment demonstrations, and underway transfer operations. A discussion of work leading to future larger and faster hydrofoils concludes the account.

(74-308) **Boeing JETFOIL Model 929-100.** WILLIAM M. SHULTZ, Boeing Aerospace Co., Seattle, Wash.

The Boeing JETFOIL is the world's most advanced commercial hydrofoil. With fully submerged foils, automatic stabilization, and waterjet propulsion, it will cruise at 45 knots in heavy seas with a ride unmatched by any other high-speed marine vehicle. In production in Renton, Wash., the first JETFOIL will be launched in the spring and undergo extensive tests and service simulations in the Puget Sound/Pacific Ocean areas. Scheduled commercial passenger services should commence in October 1974 in Hawaii and in Hong Kong. Important technical features will be discussed and construction progress shown.

(74-309) **Special Problems in the Design of Supercavitating Hydrofoils.** GABOR F. DOBAY, and ELWYN S. BAKER, Naval Ship Research and Development Center, Bethesda, Md.

A review is made of high-speed phenomena affecting the design of single-strut supercavitating hydrofoils. Nonlinear theories for the analysis of section shape are used to show the interrelationship of section lift coefficient, lift-drag ratio, section modulus, leading edge stress, and center of pressure. The special effects of free surface proximity and gravity are considered using two-dimensional nonlinear theory. The finite aspect ratio effect is investigated using a linearized lifting-surface approach. All these effects are shown to reduce the cavity length at constant cavitation number. Some recent model designs at NSRDC will be discussed.

(74-310) **A High-Speed Hydrofoil Strut and Foil Study.** RAYMOND WERMTER and YOUNG T. SHEN, Naval Ship Research and Development Center, Bethesda, Md.

A program to establish a technology base for the design of high-speed struts and foils is being undertaken at the Center. The initial program rationale is described, which then leads into a variety of detailed analytical and experimental studies of the characteristics of supercavitating (super-ventilating) and streamlined foils, and base-vented and streamlined struts. Preliminary experimental results on struts and foils in calm water and in waves in towing tanks with carriage speeds up to 50 knots are discussed. Experimental systems are being designed to further investigate the effects of twist, aspect ratio, end plates, nose radius, strut ventilation and flutter, and forced ventilation on cavity control.

(74-311) **DEH, A High Endurance Escort Hydrofoil for the Fleet.** R. ARONER and R. M. HUBBARD, Boeing Aerospace Co., Seattle, Wash.

By exploiting the experience, technology, and body of design practice produced by a 13-year-investment in hydrofoil development, this paper describes the background and results of a practical design synthesis for a large, open ocean high-endurance hydrofoil escort ship. Characteristic development emphasizes the high sea state, high-speed capabilities inherent in the 50-knot hydrofoil while retaining substantial hullborne speed and endurance. Ship's complement and self-maintenance features reflect a need to minimize new logistic requirements and the over-all design approach attempts to avoid exotic system developments often associated with advanced marine vehicles. It is concluded that a mission capable hydrofoil in the 1200-1500 ton range which appreciably advances the tactical utility of the ocean escort is feasible, viable, and available.

Tuesday/February 26 *9:00 AM/Madrid Room*

SURFACE EFFECT SHIPS

Chairman: RADM NATHAN SONENSHEIN, USN, Naval Material Command
Department of the Navy, Washington, D.C.

(74-312) **Recent Progress in Surface Effect Ship Development.** CAPT. MICHAEL C. DAVIS, USN, Naval Material Command, Washington, D.C.

Accelerated progress has been made in the last two years in the development of surface effect ship (SES) technology. This paper contains an overview of the major areas where progress has been most significant. A discussion of the primary results of recent manned SES testcraft operations is provided, including those of the SES-100A, SES-100B, HM-2, XR-1, and the new "High L/B" test vehicle. Progress in SES technical areas, such as hydrodynamics, seals, structures, propulsion, and ship dynamics, is summarized. Results of preliminary design studies of the Navy's 2000-ton SES prototype also are presented.

(74-313) **Surface Effect Ships Research with the XR-1B/C Testcraft.** N. L. WENER and F. P. BURKE, Rohr Industries Inc., Chula Vista, Calif.

(74-314) **A Simplified Representation of the Vertical Plane Dynamics of SES Craft.** PAUL KAPLAN and SYDNEY DAVIS, Oceanics Inc., Plainview, N.Y.

The basic dynamics of sidewall-type surface effect ships for vertical plane motions (heave and pitch) in response to waves is established in terms of the fundamental frequency characteristics and other critical parameters that affect craft motion. The affects of leakage variations and seal action in producing pressure variations, vehicle accelerations, and motions, etc., are illustrated by time histories of motion variables via computer simulation. The vehicle's basic dynamic characteristics provide insight into the different aspects of control that may be applied to achieve improved motion and habitability performance. A discussion of the problems associated with scaling model test results, together with techniques for the proper prediction of full-scale dynamic performance, also is provided.

(74-315) **Hydrodynamic Stability of Partically Submerged Thin Profiles at High Froude Numbers.** G. C. C. SMITH, Bell Aerospace Co., Buffalo, N.Y., and RICHARD P. SHAW, State University of New York at Buffalo, Buffalo, N.Y.

SES technology involves an order of magnitude jump in dynamic pressure compared with buoyancy vessels: 100B to 2KSES is a similar jump in weight. Large structures (aircraft, bridges, cooling towers) in high-speed flow have historically fluttered until such phenomena were accounted for by appropriate structural design criteria. Hydroelastic coupling on the SES is only significant during wave encounter when dynamic load magnification and fatigue life will be critically dependent on flutter margin. However, high Froude number hydrodynamic coefficients for posing such problems do not exist. Some initial steps for their formulation will be discussed.

(74-316) **Review of the U.S. Navy SES-100A Test Craft Program.** G. D. WESTCOT, Aerojet General Corp., Tacoma, Wash.

(74-317) **Test and Evaluation of the SES-100B.** C. L. FORREST, Bell Aerospace Co., New Orleans, La.

This paper will review the over-all program objectives and the specific technical objectives of the SES-100B. The SES-100B which was built and tested by the Bell Aerospace Co., a division of Textron, will be described in terms of the major mechanical system on the craft as well as the important hull construction features and the data acquisition system. The test program will be reviewed from the initiation of testing to the current time period. The test results will be presented and problem areas discussed. Short movie clips will be shown for significant tests.

Tuesday/February 26 *1:30 PM*

VEHICLE DEMONSTRATIONS IN SAN DIEGO BAY

Narrator

RADM. RANDOLPH W. KING, USN
Hydrofoil U.S.S. FLAGSTAF, The Navy XR-1C Surface Effect Ship,
and other advanced marine vehicles.

Tuesday/February 26 *6:00 PM*

NO-HOST COCKTAIL PARTY

Tuesday/February 26 *7:00 PM*

BANQUET

Speaker: VICE ADMIRAL FRANK H. PRICE, JR., USN
Director, Ship Acquisition & Improvements
Office of the Chief of Naval Operations

Wednesday/February 27 *9:00 AM/Madrid Room*

AMPHIBIOUS SURFACE EFFECT VEHICLES

Chairman: JAMES L. SCHULER, Naval Ship Systems Command
Department of the Navy, Washington, D.C.

(74-318) **Amphibious Surface Effect Vehicle Technology—Past, Present, and Future.** JOHN B. CHAPLIN, Bell Aerospace Co., New Orleans, La.

The technology of amphibious air cushion vehicles has reached a state of development where the discussion of all the technical aspects would be beyond the scope of a paper such as this. The detailed technology to be presented in the other papers of this session is evidence of this fact. The most unique technology of the air cushion vehicle is the cushion system. While many other design features are equally important, they are not as clearly unique as the cushion system. For example, the structural design problems have some similarity to other high-speed marine craft experience and the propulsion systems can rely on the technology developed for aircraft or high-speed marine systems.

(74-319) **JEFF Craft—Navy Landing Craft for Tomorrow.** M. W. BROWN, Naval Ship Research and Development Center, Bethesda, Md.

(74-320) **The Development of the Canadian Air Cushion Vehicle Industry.** R. G. WADE, Ministry of Transport, Ottawa, Ontario, Canada

(74-321) **Operational and Technical Problems of Commercial Hovercraft.** L. R. COLQUHOUN, Leslie Colquhoun & Associates, Minster, Ramsgate, Kent, England

This paper presents an account of operational and commercial problems experienced during four years' operations with the British Hovercraft Corporation's 200-ton amphibious SRN-4 hovercraft on the English Channel and, recently, of more conventional operations on the River Thames using the Hovermarine HM-2 MK 3 sidewall type hovercraft. Traffic growth and potential are discussed with reference to effects on hovercraft market share. Descriptions of operational, technical, and maintainance problems are listed and their effects on reliability and cost are assessed. Conclusions cover thoughts on future craft and their viability for commercial operations.

(74-322) **Rational Dynamic Loads Analysis for Air Cushion Vehicles in Random Seaway or Terrain.** ROBERT J. BARTHOLOMEW, Aerojet General Corp., Tacoma, Wash.

(74-323) **Dynamic Performance of an Air Cushion Vehicle in a Marine Environment.** J. A. FEIN, A. H. MAGNUSON, and D. D. MORAN, Naval Ship Research and Development Center, Bethesda, Md.

Three aspects of Air Cushion Vehicle (ACV) performance are treated using trial results and engineering analysis: seakeeping response, maneuvering and control, and craft-generated wave wake profiles. Full-scale trial data for 50 ton ACV are presented. Response Amplitude Operators calculated from seakeeping ship motion data are presented for heave, pitch, and roll motions. The effect of various control force configurations on ACV maneuvering performance is determined from trial data and motion simulation studies. The craft-produced wake wave profiles are presented and compared with theoretical predictions for various speeds.

Wednesday / February 27

2:00 PM / Madrid Room

SMALL-WATERPLANE-AREA TWIN-HULL SHIPS

Chairman: SIDNEY HERSH, Consultant, Bethesda, Md.

(74-324) **The Small Waterplane-Area Twin Hull (SWATH) Program—A Status Report.** SETH HAWKINS, Naval Ship Research and Development Center, Bethesda, Md., and THEODORE SARCHIN, Naval Ship Engineering Center, Hyattsville, Md.

The paper will present an up-to-date status report of the progress in SWATH ship technology, design development, and utilization evaluation. It will commence with a brief overview of the history of the concept, reasons for U.S. Navy investment in the concept, and how it may ultimately fit into the spectrum of marine vehicles. This will be followed by: a delineation of technology requirements (and why); how these requirements have and are being met (with emphasis on those areas not covered in subsequent session papers); general results of mission and concept utilization studies; SWATH ship design developments; SWATH ship concept demonstrations; and, finally, an overview of future prospects and technology requirements.

(74-325) **The Still-Water Resistance and Powering Characteristics of Small Waterplane-Area Twin-Hull (SWATH) Ships.** WEN-CHIN LIN and WILLIAM G. DAY JR., Naval Ship Research and Development Center, Bethesda, Md.

This paper presents the results of towing-tank experiments carried out on models of Small Waterplane-Area Twin-Hull (SWATH) ships. The experimental data consist of the resistance and propulsion characteristics. A theory to predict the wave resistance of the SWATH ships has been developed. The results of theoretical predictions and their comparison with the corresponding residuary resistance data also are presented. The generally good agreement between the experimental data and the theoretical predictions indicates that the theory may be used as a reliable tool to predict the resistance characteristics of the SWATH ships.

(74-326) **Structural Weight Determination for SWATH Ships.** E. L. ARONNE, Naval Ship Engineering Center, Hyattsville, Md., and F. A. LEV and N. S. NAPPI, Naval Ship Research and Development Center, Bethesda, Md.

This paper briefly describes a series of structural design and weight estimating computer procedures ranging in complexity from gross weight fraction approximation to a more detail structural design. The effects on the structural weight of varying geometry, of sea-induced loads, of local loads, and of changing the primary construction material to other higher strength steels and/or aluminum alloys are presented. The assumed loads are cited, and the need for better local and over-all load definition is discussed. Opinions of the merits and shortcomings of these procedures are given.

(74-327) **Sinkage and Trim of SWATH Demihulls.** R. B. CHAPMAN, Naval Undersea Center, San Diego, Calif.

The sinkage forces and trim moments acing on Small Waterplane-Area Twin-Hull (SWATH) ship demihulls are investigated by considering them as a collection of simple shapes—parabolic, uniform struts, and blunt cylindrical hulls. Numerical evaluation is aided, in part, by analytic integration for these simple forms. Experiment and theory show good agreement for struts without hulls and for simple Rankine avoid hulls without struts. Interaction between struts and hulls is also examined. Rough agreement between theory and experiment is obtained for simple demihulls.

(74-328) **Hydrodynamics of the 190-ton Stable Semisubmerged Platform (SSP).** T. G. LANG and D. T. HIGDON, Naval Undersea Center, San Diego, Calif.

The form, hydrodynamic design, and predicted performance of the SSP are described and analyzed. Particular design areas covered are the twin submerged hulls, four surface-piercing struts, bow section of the above-water cross structure, aft stabilizing fin and flaps, forward-mounted canard control surfaces, rudders, and the controllable and reversible propellers. Hydrodynamic loads and motion in waves are analyzed. The over-all design is evaluated in light of design experience, model test results, and preliminary operating experience with the SSP. Results are presented which indicate significant reduction in motion in waves, compared to monohulls, as well as a significant increase in rough-water speed.

Wednesday/February 27 *8:30 PM/Madrid Room*

EVENING PANEL DISCUSSION— THE FUTURE OF ADVANCED MARINE VEHICLES

Chairman: RADM NATHAN SONENSHEIN, USN, Naval Material Command
LESLIE R. COLQUHOUN, Leslie Colquhoun Associates
PHILLIP EISENBERG, Hydronautics Inc.
RADM ROBERT C. GOODING, USN, Naval Ship Systems Command
RADM GEORGE G. HALVORSON, USN, Office of Chief of Naval Operations
JOHN KELLY, Bell Aerospace Co.
FRANK McCREERY, Rohr Industries Inc.
RADM ABE H. SIEMANS, JR., U.S. Coast Guard
BGEN HERBERT L. WILKERSON, U.S. Marine Corps

Thursday/February 28 *9:00 AM/Madrid Room*

TECHNOLOGY ADVANCEMENT

Chairman: RADM ROBERT C. GOODING (USN), Naval Ship Systems Command, Washington, D.C.

(74-329) **Technological Constraints in Advance Marine Vehicle Design.** B. H. CARSON, U.S. Naval Academy, Annapolis, Md., R. H. KRIDA, Naval Air Systems Command, Department of the Navy, Washington, D.C., and R. M. STEVENS, Naval Ship Research and Development Center, Bethesda, Md.

Future expansion of ship performance envelopes will depend not only upon the exploitation of promising new hull forms and configurations, but of necessity must depend equally upon parallel advances in ancillary technologies such as materials, propulsion systems, and control systems. It is the intention of this paper to explore these allied technologies with an aim of identifying limitations, as they now exist or reasonably may be foreseen, that must be accepted as challenges by the technological community if progress is to continue. More subjective considerations and the limitations thus imposed, such as manning, habitability, and survivability, also are discussed.

(74-330) **The Outlook for Lighter Structures in High-Performance Marine Vehicles.** S. R. HELLER JR., The Catholic University of America, Washington, D.C., and DENNIS J. CLARK, Advanced Hydrofoil Systems Project Office, Naval Ship Research and Development Center, Bethesda, Md.

Structural weights of existing high-performance marine vehicles, principally hydrofoil craft, are examined to determine the design or geometric parameters that have significant effect. For total structural weight, vehicle density and structural density are shown to be governing. Similarly, the governing parameters for individual weight groups are identified. These governing parameters and the loads which determine scantlings, where known, are compared to develop measures of efficient use of structural material. These figures of merit are applied to a number of existing high-performance marine vehicles and projections of what might be attainable in the future are made.

(74-331) **Advanced Composites and Their Application to Hydrofoils.*** L. B. GRESZCUK, McDonnell Douglas Astronautics Co., Huntington Beach, Calif., A. V. HAWLEY, Douglas Aircraft Co., Long Beach, Calif., and T. F. WHITE, Naval Ship Engineering Center, Hyattsville, Md.

Following a brief review of the advanced composites and their application to structural components of aircraft, missiles, and space vehicles, studies are presented on potential application of composites to various structural components of hydrofoils, including decking, hull, foils, and strut. It is shown that application of various composites to the hull and decking of hydrofoil can yield a weight savings of 16%-51% whereas application of composites to struts and foils shows potential weight savings of 60% compared to steel counterparts. Results also are presented on cost effectiveness of composites as applied to hydrofoils and on influence of weight savings on hydrofoil performance.

*Work performed by McDonnell Douglas Corp. under the sponsorship of Naval Ship Systems Command.

(74-332) **Current Status of U.S. Navy Stability and Buoyancy Criteria for Advanced Marine Vehicles.*** L. L. GOLDBURG and R. G. TUCKER, Naval Ship Engineering Center, Hyattsville, Md.

Hullborne stability and buoyancy criteria (intact and damage) are presented for advanced marine vehicles such as hydrofoil craft, air cushion vehicles, surface effect ships, and low waterplane catamarans. Not covered is stability during flying or on-cushion modes. The criteria attempt to recognize special operations and hazards associated with the unusual characteristics of these types. Examples are: the danger of large rip damage when flying at high speeds, the potential of large unsymmetrical flooding, and the lightweight structure resulting in less resistance to damage. The criteria presented herein are likely to change as more design and operational

experience is acquired.

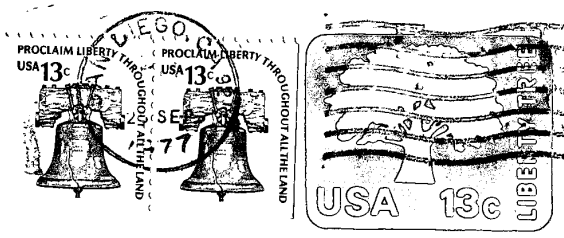
*It should be noted that the opinions expressed in the paper are those of the authors and not necessarily those of the Naval Ship Engineering Center.

(74-333) **Supercritical Planing Hulls.** PETER R. PAYNE, Payne Inc., Annapolis, Md.

The intolerable pounding of conventional planing hulls is the chief reason for the development of alternative hydrofoil and SES vehicles, in an attempt to achieve high speeds with motions that are commercially and militarily acceptable. Our approach has been to find out why a conventional planing hull pounds, and then to devise new planing hull forms which avoid the problem. Work over the last ten years, including a dozen experimental boats, has resulted in forms which largely meet this objective, we believe. Experimental data indicate that our latest hull—the Sea Knife—has a better ride than SES or surface-piercing hydrofoils and, for a much lower cost, is not much inferior to the fully submerged hydrofoil.

(74-334) **Selection of Propulsion Systems for Advanced High-Speed Marine Vehicles.** ROBERT A. BARR and ROBERT J. ETTER, Hydronautics Inc., Laurel, Md.

CAPT. CARVAL R. RICHARDSON U.S.N (Ret.)



ADMIRAL STANSFIELD TURNER U.S.N
DIRECTOR CENTRAL INTELLIGENCE AGENCY
Washington D.C

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The Director of Central Intelligence

Washington, D.C. 20505

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27 October 1977

Basic attached

Mr. Robbie Willis

AT

Dear Robbie,

Thank you for your interest in the Central Intelligence Agency. Enclosed is some literature describing our work.

Good luck and best wishes.

Yours,

STANSFIELD TURNER

Enclosures

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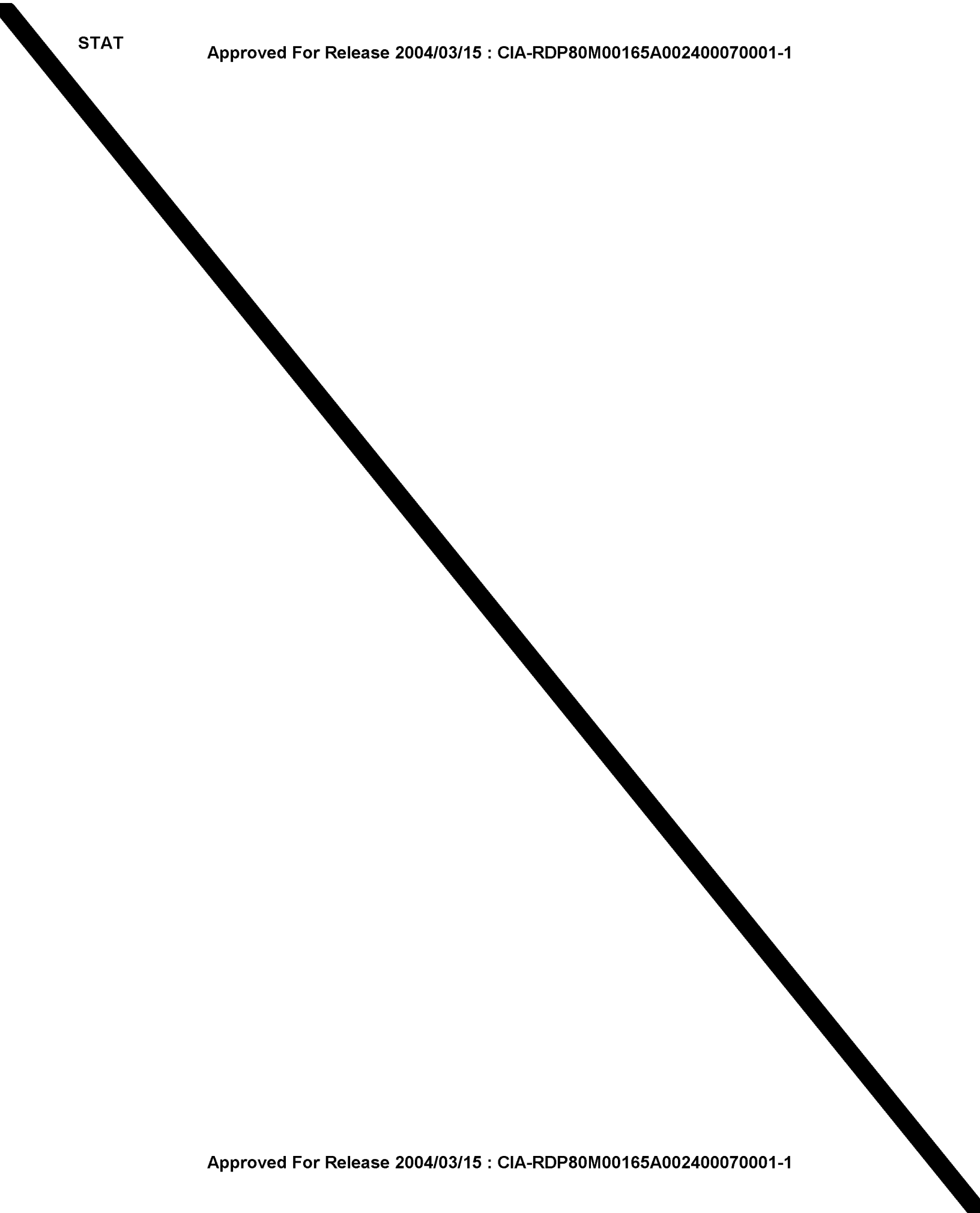

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ARMED FORCES STAFF COLLEGE
7800 HAMPTON BOULEVARD · NORFOLK, VIRGINIA 23511

OFFICE OF THE COMMANDANT

19 OCT 1977

Admiral Stansfield Turner, USN
Director, Central Intelligence Agency
Washington, D. C. 20505

Dear Admiral Turner:

I would like to follow up on my recent letter and extend an invitation to you to speak to the Sixty-second Class of the Armed Forces Staff College. A suggested date for your presentation is 28 November 1977 at 1000 hours. By that time, our students will have undergone much of our core curriculum which emphasizes joint organization and planning. To fulfill their complex planning tasks, joint staff officers must have a firm understanding of the key roles and responsibilities of the intelligence community in the formulation of our national policy and strategy. Your experience as an operational commander and as Director, Central Intelligence Agency would provide a unique contribution to the students' understanding of this vital process. I am certainly aware of your demanding schedule; therefore, if 28 November is not convenient for you, we would like to schedule your presentation at a date your schedule permits. Also, we will be pleased to schedule your presentation after duty hours if that would be more convenient.

The scope of your presentation is left to your discretion; however, a possible topic which would provide our students with insight into the national intelligence effort could be, "The Role of The Intelligence Community in the Formulation of United States Foreign Policy." The suggested date for your presentation occurs during our Foreign Internal Defense block of instruction in which the students in each of our seminars are organized as "Country Teams" with each student playing the role of a key embassy team member. At that time, our Allied students will be on an extended field trip and the audience will consist of U. S. officers and civilians who are cleared for access to TOP SECRET material.

In our usual format, lectures last about 45 minutes followed by a 15 minute break and a 45 minute question period. I will be pleased if your schedule will permit you to remain for lunch with several students and faculty members.

Admiral Stansfield Turner, USN

We have a strict nonattribution policy which provides you a high degree of assurance that your remarks will not be discussed outside the College audience. This permits a frank discussion of controversial issues and greatly enhances the learning experience of the student body. It is our policy that no notes will be taken, but we usually record the lectures and informal question periods. However, if you request, no recording of your lecture and question period will be made. In that respect, any transcript or recording of your presentation may be subject to public disclosure under the provisions of the Freedom of Information Act.

Captain George D. Rush, III, USAF, of my Guest Speaker Office (AUTOVON: 690-5422; commercial: 804-444-5422 will coordinate the arrangements for your visit.

I consider it essential that our students fully appreciate the importance of and valuable contributions made by members of the intelligence community. I am certain that you will best be able to foster that appreciation.

I hope that you will be able to join us.

Sincerely yours,

L. GORDON HILL, JR.
Major General, USA
Commandant

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