SSC-281

BIBLIOGRAPHY FOR THE STUDY OF PROPELLER-INDUCED VIBRATION IN HULL STRUCTURAL ELEMENTS

SHIP STRUCTURE COMMITTEE
1978

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Ship Structure Committee

An Interagency Advisory Committee
Dedicated to Improving the Structure of Ships

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SR-1240

AUG 1978

The rapid advance in ship size and power and the trend toward lighter hull scantlings prompted the Ship Structure Committee to investigate the propeller-induced vibrations in the hull and superstructure of the ship. High vibratory forces in the ship can cause discomfort in the living quarters, excessive "panting" type deflection of tank bulkheads, and fatigue cracks in webs and plating.

The first phase of this new project was to conduct a literature search. The bibliography developed is being published separately to be available at the October 15 - 16, 1978, Ship Vibration Symposium, sponsored jointly by the Ship Structure Committee and The Society of Naval Architects and Marine Engineers.

Henry H. Bell
Rear Admiral, U.S. Coast Guard
Chairman, Ship Structure Committee

FINAL TECHNICAL REPORT

on

Project SR-1240

"Propeller-Induced Vibration in Hull Structural Elements"

BIBLIOGRAPHY FOR THE STUDY OF PROPELLER-INDUCED VIBRATION IN HULL STRUCTURAL ELEMENTS

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Contract No. DOT-CG-61907-A

U.S. Coast Guard Headquarters
Washington, D.C.
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FOREWORD

This bibliography was prepared as part of the effort in Ship Structure Committee Project SR-1240, "Propeller-Induced Vibration in Hull Structural Elements." It is published separately from the final report because it can serve as a ready reference to investigators in the field.

This document is not meant to be an exhaustive bibliography of all references dealing with propeller-induced vibrations. Emphasis has been placed on the current generation of large, high-powered ships. This is evidenced by the fact that of the approximately 550 entries, over 60 percent were published after 1970.

The first part of the bibliography contains references which were reviewed and classified according to content. The nomenclature for this classification is given on page v. A supplemental bibliography covering subjects related directly to ship structures and ship vibration is also included. It contains references that were not reviewed, but which the investigators feel are important to the field. Finally, the bibliography lists references from other technological areas directly applicable to the problem of propeller-induced vibrations in ships.

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NOMENCLATURE FOR THE BIBLIOGRAPHY CLASSIFICATION

SUBJECT:

CGF	- CAVITATION GENERATED FORCES
DC	- DESIGN CRITERIA
HRP	- HULL RESPONSE PREDICTION
HRV	- HUMAN REACTION TO VIBRATION
LPRP	- LOCAL PLATING RESPONSE PREDICTION
MSRP	- MAIN SHAFT RESPONSE PREDICTION
PF	- PROPELLER FORCES AND MOMENTS
PP	- PROPELLER GENERATED PRESSURES
PRI	- PROPELLER RUDDER INTERACTION
PV	- PROPELLER VIBRATION

MATHEMATICAL CONTENT:

VM	- VERY MATHEMATICAL
MM	- MODERATELY MATHEMATICAL
SM	- SLIGHTLY OR NON-MATHEMATICAL

TYPE OF PAPER:

AT	- ANALYTICAL
EX	- EXPERIMENTAL
EXF	- EXPERIMENTAL-FULL SCALE
EXM	- EXPERIMENTAL-MODEL
SU	- SURVEY

TECHNICAL UTILITY:

RD	- RESEARCH AND DEVELOPMENT
DS	- DESIGN ORIENTED

ADDITIONAL SYMBOLS

(XX REF)	- NUMBER OF REFERENCES
(ABS)	- REFERENCE CLASSIFIED FROM ABSTRACT

N O T E S

CODE OF ABBREVIATIONS FOR BIBLIOGRAPHY

ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
BSRA	BRITISH SHIP RESEARCH ASSOCIATION
DNV	DET NORSKE VERITAS
DTMB	DAVID TAYLOR MODEL BASIN (NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER)
IHI	ISHIKAWAJIMA-HARIMA HEAVY INDUSTRIES CO. LTD.
IME	INSTITUTE OF MARINE ENGINEERS
INA	INSTITUTE OF NAVAL ARCHITECTS
ISP	INTERNATIONAL SHIPBUILDING PROGRESS
ISSC	INTERNATIONAL SHIP STRUCTURES CONGRESS
JSNA	JOURNAL OF THE SOCIETY OF NAVAL ARCHITECTS
JSNAJ	JOURNAL OF THE SOCIETY OF NAVAL ARCHITECTS OF JAPAN
JSR	JOURNAL OF SHIP RESEARCH
MESJ	MARINE ENGINEERS SOCIETY OF JAPAN
MHI	MITSUBISHI HEAVY INDUSTRIES
NACA	NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS
NECIES	NORTH EAST COAST INSTITUTE OF ENGINEERS AND SHIPBUILDERS
NSRDC	NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER (DAVID TAYLOR MODEL BASIN)
RINA	ROYAL INSTITUTION OF NAVAL ARCHITECTS
RRIAM	REPORTS OF RESEARCH INSTITUTE FOR APPLIED MECHANICS, KYUSHU UNIVERSITY, JAPAN
SIT, DL	STEVENS INSTITUTE OF TECHNOLOGY, DAVIDSON LABORATORY
SNAME	SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS
SSC	SHIP STRUCTURE COMMITTEE
TINA	TRANSACTIONS OF THE INSTITUTE OF NAVAL ARCHITECTS

SUBJECT: CAVITATION GENERATED FORCES (CGF)

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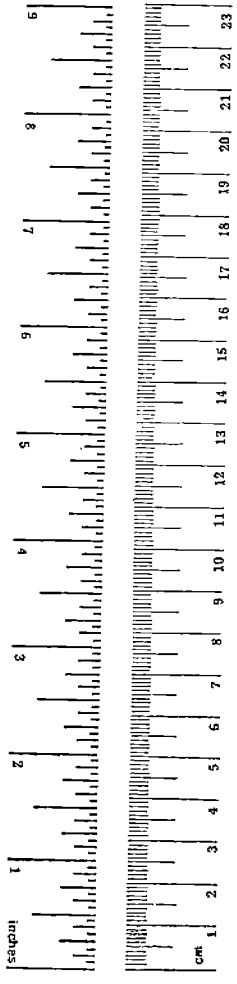
☆U.S. GOVERNMENT PRINTING OFFICE: 1978-261-264/254

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

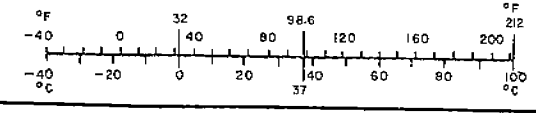
Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SSC-281		

4. Title and Subtitle	5. Report Date
BIBLIOGRAPHY FOR THE STUDY OF PROPELLER-INDUCED VIBRATION IN HULL STRUCTURAL ELEMENTS	July 1978
	6. Performing Organization Code
7. Author(s) O. H. Burnside, D. D. Kana, and F. E. Reed	8. Performing Organization Report No. SWRI 02-4821
9. Performing Organization Name and Address Southwest Research Institute 6220 Culebra Road, P. O. DRawer 28510 San Antonio, TX 78284	10 Work Unit No. (TRAIS) SR-1240
	11. Contract or Grant No. DOT-CG-61907-A
12. Sponsoring Agency Name and Address Commandant, G-FCP-3/71 U. S. Coast Guard WAshington, D.C. 20590	13. Type of Report and Period Covered Final Bibliography 2/4/78 thru 1/7/78
	14. Sponsoring Agency Code

15. Supplementary Notes

16 Abstract

ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This bibliography was prepared as part of the effort on Ship Committee Project SR-240, "Propeller-Induced Vibration in Hull Structural Elements." It is published separately from the final report because it can serve as a ready reference to investigators in the field. This document is not meant to be an exhaustive bibliography of all references dealing with propeller-induced vibrations. Emphasis has been placed on the current generation of large, high-powered ships.

17. Key Words	18. Distribution Statement
Propellers Vibration Ship Hull Structures Structural Analysis Hydrodynamic Forces Cavitation	Document is available to the public through the National Technical Information Service, Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	65	

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