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THE NATIONAL SHIPBUILDING RESEARCH PROGRAM

**Integrated Hull Construction,
Outfitting and Painting**

**U.S. DEPARTMENT OF TRANSPORTATION
Maritime Administration**

FOREWORD

“Just give us the plans and material on time and we can build ships as productively as anyone.” So say traditional production bosses. Nothing could be further from the truth because a critical element is missing. Managers of the most productive shipyards have succeeded in getting their *production people highly involved in design matters starting with development of contract plans*. Thus, each of their design efforts begins and continues in the context of a premeditated building strategy for integrated hull construction, outfitting and painting. *Design is truly an aspect of planning.*

As compared to traditional shipyards, the organizations of people, information and work processes are different, interdependent and comprise constantly self-improving shipbuilding systems.

Very much is dependent on continuous hiring of recent-graduate engineers who start in shops as process engineers and are systematically transferred to achieve both production and design experiences in hull construction, outfitting and painting. Members of this intelligent cadre are assigned successively as shop managers, senior production engineers and department managers while shifting between organizations responsible for different types of work.

The integrated methods described herein were developed by Ishikawajima-Harima Heavy Industries (IHI) of Japan. An aspect that is particularly noteworthy is frequent reference to statistical control of manufacturing, i.e., accuracy control. As early as 1967, the Japanese Society of Naval Architects reported that accuracy control “epoch makingly” laid the foundation of modern ship construction methods.

This publication should be particularly useful to:

- senior managers who have decided to revolutionize their shipbuilding methods and who have sufficient authority to counter traditionalists,
- design organizations including independent design firms because of the disciplines described for communications between production people and designers, basic designers and detail designers, and between people having hull construction, outfitting and painting responsibilities in both design and production organizations,
- officials of the U.S. Navy who, early in 1983, announced plans to do their own design work for a new class of ships, and
- students or others concerned with management of *any* large industrial project.

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The material on which the contents are based was compiled by a project team led by Y. Okayama, International Division, Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI) of Japan. Team members included K. Ando, M. Tomisawa and K. Honda. Their work was significantly rewritten, supplemented and reorganized by L.D. Chirillo assisted by R.D. Chirillo.

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