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7. Author(s) William H. Jones, Vernon Guthrie, David Walker, Thomas Zanin and Andrew Huff				8. Performing Organization Report No. R&DC 27/97	
9. Performing Organization Name and Address U.S. Coast Guard Research and Development Center 1082 Shennecossett Road Groton, CT 06340-6096		JBF Associates, Inc. 1000 Technology Drive Knoxville, TN 37932-3353		10. Work Unit No. (TRAIS)	
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15. Supplementary Notes The R&D Center's technical point of contact is Mr. Bert Macesker (860-441-2726). The project officer at Coast Guard Headquarters is CDR Rickey George, (G-WKS-4).					
16. Abstract (MAXIMUM 200 WORDS)  Due to the new challenges (e.g., government downsizing, increased system complexity, ever-changing high-risk operations) faced by the Coast Guard, the Coast Guard Research and Development Center (RDC) was requested to explore the possibility of applying system safety concepts, including the use of risk analysis and enhancement of inspection procedures, to improve Coast Guard operations and facility safety. The Coast Guard RDC teamed with JBF Associates, Inc. (JBFA), a consulting firm specializing in hazard and risk analysis/management, to develop a risk-based loss prevention program. The initial focus was on developing one portion of the risk-based loss prevention program, a risk assessment process. This report discusses the development, validation, and end product (the Integrated Risk Assessment [IRA] process) of this effort. Effective implementation of the IRA process provides the Coast Guard with risk-based information for: (1) controlling and reducing loss exposure, (2) making risk-based decisions, and (3) using limited resources more efficiently. The IRA process proved to be an effective and efficient risk assessment tool for various types of vessels and their operations, as well as shore facilities and their operations.  This report contains three volumes: Volume I consists of the main text of the report and Attachment A: Integrated Risk Assessment (IRA) Manual. Volume II consists of Attachment B: Coarse Hazard Analysis of a WMEC-210 Vessel in Support of the Paragon Project, and Attachment C: Coarse Hazard Analysis of the Integrated Support Command (ISC) at Seattle, WA. Volume III consists of Attachment D: Detailed Hazard Analysis of WMEC-270 Small Boat Operations, Attachment E: Detailed Hazard Analysis of WLIC-160 Deck Operations, and Attachment F: Risk-based Safety Survey of a WHEC-378 Vessel.					
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## EXECUTIVE SUMMARY

### Integrated Risk Assessment (IRA) Program

This report describes the efforts within the Loss Exposure and Risk Methodology (LERAM) project during 1996-1997 to develop a forward-looking loss system for the U.S. Coast Guard. The IRA program integrates risk assessment and traditional safety survey activities to identify, characterize, and monitor hazards and safeguards from a risk prioritization perspective. In addition, the IRA provides the risk characterization information needed for risk management activities that are currently being developed and integrated into existing Coast Guard management practices. Risk characterization information is obtained from a variety of data sources and subject matter expert (Coast Guard operations and maintenance personnel) assessments facilitated by trained assessment facilitators (Coast Guard health and safety staffs).

The IRA program is a systematic, predictive approach for characterizing risks associated with operational and maintenance activities and preventing potential losses. The program approach is to characterize total risk to a Coast Guard unit or facility. Characterizing how inherent hazards can produce losses, assessing the types/levels of safeguards needed, developing recommendations for reducing risks, and generating risk profiles for operations/facilities enables Coast Guard leadership to effectively manage risk. Possibly, just as important, since operational personnel characterize the hazard and safeguard interplay involved with accident scenarios, their understanding, awareness, will lead to personal risk reduction measures.

Risk information is used to assist in assessing the significance and importance of safeguards for preventing or mitigating losses. Safeguards can be ranked based on their contribution to the overall risk and monitored appropriately. Understanding safeguard contributions to risk enables the scope and number of safety surveys to be modified to more effectively employ trained safety professionals. In addition, characterizing the effectiveness of safeguards provides valuable information to correct, modify, or eliminate safeguards to reduce risk and reduce maintenance and monitoring resources.

The Coast Guard Integrated Risk Assessment (IRA) Program addresses risks from the perspective deemed most appropriate by Coast Guard operations, maintenance, health and safety, and program personnel. Industry accepted techniques, definition, and measures of success were used as the basis for a process that provides the Coast Guard with the means necessary to effectively identify, assess, and manage risk. It is a scientific, predictive approach, based on both historical information and expert judgment.

The Integrated Risk Assessment program consists of a both coarse and detailed risk analysis processes, the integration of risk assessment into our established safety survey practice, and necessary training, techniques, and tools. The critical management systems necessary to support such a program and

ensure its integration into other critical business practices are currently under development. The Coast Guard's risk management program while being incrementally developed and fielded will completely transition from the research and development phase by the year 2001.

As with industry and other government agencies, the Coast Guard expects risk assessment/management methods to be continuously revised to account for different types of loss exposures, new technologies that affect data, analysis, documentation, and communication of the results, and changing requirements.