

Coast Guard Merchant Mariner Medical Evaluations: An Essential Human Systems Link in the Maritime Transportation System Safety Chain

On May 26, 2002, the towboat Robert Y. Love was traveling northbound on the McClellan-Kerr Arkansas River, near Webbers Falls, Oklahoma. It veered off course and rammed the Interstate 40 highway bridge, collapsing a 503-foot section of the bridge, which fell into the river and onto the barges below. Eight passenger vehicles and three trucks fell into the river. The collision resulted in 14 fatalities and 5 injuries and caused an estimated \$30.1 million in damage to the bridge. The National Transportation Safety Board determined that the probable cause of the collision was the captain's loss of consciousness due to a heart condition.

On October 15, 2003, the Staten Island Ferry Andrew J. Barberi allided with a pier at the Staten Island Ferry terminal. Fifteen crewmembers and an estimated 1,500 passengers were on board. Eleven passengers died in the collision and 70 were injured. The NTSB determined that the probable cause of the collision was the assistant captain's medical incapacitation.

Homeland Security and Maritime Transportation System Safety

The Coast Guard's Mariner Licensing and Documentation (MLD) program is a vital component of the Department of Homeland Security's *Strategic Plan*. The Department's strategic plan goals include:

- Prevention -- Detect, deter and mitigate threats to our homeland.
- Protection -- Safeguard our people and their freedoms, critical infrastructure, property and the economy of our Nation from acts of terrorism, natural disasters, or other emergencies.

A specific protection objective is "Strengthen the security of the Nation's transportation systems" Safety and security are two sides of the same coin- strengthen the security of the transportation network while working to remove all threats or barriers to the safe movement of commerce and people. This requires coordination with federal, state, local agencies, as well as our international and private sector partners, to ensure the transportation system remains a safe and vital economic link. The Coast Guard's MLD program is based upon verifying the triad of mariner qualifications: professional competency, security, and medical evaluations.

In addition to professional competencies and character standards, mariners applying for U.S. Coast Guard-issued credentials must also meet minimum physical and medical standards to ensure maritime safety. Mariners must be physically and medically able to perform the routine and emergency duties which may be required while acting under the authority of their credential. While maintaining a sufficient national maritime industry workforce is in the national interest, the Coast Guard must ensure that all applicants for credentials can safely work on vessels and their physical and medical conditions do not impair their abilities to perform their required duties.

The Coast Guard currently processes approximately 60,000 merchant mariner transactions annually, of which approximately 4,000 mariners require medical waivers. Currently these are forwarded to the Coast Guard National Maritime Center in Arlington, Virginia for medical staff review, and their recommendations returned back to the local OCMI. Under the new NMC restructuring and centralization initiative to be completed

in late 2007 all medical reviews will be performed at the new NMC complex in Martinsburg, West Virginia.

The NMC medical evaluation system is a maritime public health system which develops and carries out policies which affect both mariners' safety and public safety. The Coast Guard's MLD medical policies are public health policies in that they balance individual risks and benefits with the safety of the public populations which may be affected by a maritime incident. As in other public health policies, such as immunizations, protecting the health of populations sometimes adversely affects individuals. A common example of this is the balance between preventing serious childhood diseases through required immunizations versus the rare and tragic cases of children harmed from vaccines. We have accepted this risk because the public safety benefits outweigh the individual burden. Enforcing reasonable medical and physical standards which protect public safety is necessary, even though a small number of mariners may be adversely affected.

Maritime Transportation System Human Factors

The leading cause of maritime casualties is human factors, accounting for approximately 90% of casualties. Human factors affecting maritime operations include::

- Physical (reach, lift, carry)
- Pathological (medical)
- Psychological (stress)
- Physiological (fatigue)
- Psychosocial (behavior)
- Pharmacological (drugs)

There are no maritime "accidents". Maritime mishaps require a well-coordinated chain of errors and causes. If any of the multiple causes and errors are removed, the mishap will not occur. Safety systems are designed to interrupt the mishap chain. For every injury-causing mishap there are approximately ten "near misses" where someone or something broke the chain of events and prevented a mishap. For every fatal mishap there are approximately ten injury-causing mishaps. Near misses, where human errors were made but did not result in an injury, make up the base of this mishap pyramid. Mishaps such as the *Robert Y. Love* and *Andrew J. Barberi* are the peak of the safety pyramid. The goal of the MLD medical evaluation system is to reduce the medical and physical-related human factors at the base of the pyramid in order to prevent the few, but serious, injury and death-causing mishaps.

While many recent research and educational efforts have addressed physiological fatigue and Crew Endurance Management, the other human factors which also adversely affect mariners' performance and safety have been relatively ignored. The physical, pathological, and pharmacological causes of maritime mishaps have been documented in numerous marine casualty reports. We also know from experience in the commercial driver and aviation professions, previous NTSB reports, and the Coast Guard Marine Information for Safety and Law Enforcement (MISLE) database that these human performance elements are responsible for many injuries and deaths. The mission of the NMC Medical Evaluation Branch is to enhance Maritime Transportation System safety by minimizing human factor mishap causes from medical and physical conditions.

Mariner Medical Evaluation Challenges

In its report on the 2003 collision of the *Andrew J. Barberi* the NTSB determined that the assistant captain's unexplained incapacitation was a causal factor in the casualty, resulting in the catastrophic death of 10 passengers and 70 injuries. NTSB recommended that the Coast Guard review its medical evaluation process and correct deficiencies. Concerns identified by NTSB included inconsistencies among the Coast Guard Regional Examination Centers (RECs), tracking of performed medical exams, and the limited capability of the Coast Guard to review medical evaluations made by personal health care providers. The report also recommended that the Coast Guard review the medical oversight process with occupational medicine experts. A project team was chartered in September, 2005 by the Assistant Commandant for Prevention to revise the MLD medical evaluation processing system.

The mariner medical evaluation system re-engineering project team's goal was to promote safety, efficiency, and consistency. The medical evaluation system needed to be a centralized process consistent with the concurrent NMC restructuring and centralization initiative, while incorporating innovative technology and process efficiencies. The process had to ensure public safety while meeting customer (applicant) expectations, while maintaining flexibility to implement new guidelines as medical practice and knowledge change. Medical evaluation of mariner credential applicants is an extremely complex issue, affected by external constraints of statutes, Federal regulations, and STCW, ILO, and international agreements. Mariners have additional safety responsibilities for their vessels and passengers that DOT operators do not. Other challenges to ensuring quality and consistency include a five year merchant mariner credential (MMC) period, allowing any healthcare provider to perform the exam, a lack of training and familiarization of maritime operations by most examiners, the lack of a quality assurance system, and absence of regulations requiring mariners to report interim changes in medical conditions.

Maritime operations may impose unique physical and medical demands on mariners. Mariners must meet minimum physical requirements, such as lifting and climbing ladders, in order to perform their safety responsibilities. In the event of vessel emergency, immediate response may be limited to a vessel's crew, and outside help may not be available. These duties are not limited to conning a vessel or standing an engine room watch. Mariners may have to don fire-fighting equipment to combat a shipboard blaze, assist passenger evacuations, assist in bringing an injured person back onboard the vessel, or quickly don an exposure suit to abandon ship. If a mariner cannot conduct these types of activities, then he or she becomes a safety risk to the vessel. Due to the great variability in occupational environments in which mariners may be employed while holding a credential(s), the Coast Guard must evaluate mariners using standards for the potential performance requirements associated with the credential(s) applied for.

The desired medical evaluation system is based upon several principles:

- Maritime medical standards are intended to ensure transportation safety versus current standards of primary healthcare. The Coast Guard is not the mariner's primary care manager. MMC medical evaluations are based upon the risk to maritime safety, not long-term health consequences of medical conditions on the mariner.

- Disqualifying conditions require waivers by the Coast Guard. The mariner's primary care provider, medical specialists, or person performing the examination can report the facts but can not make these determinations. Quality assurance requires a standardized medical evaluation process by a professional clinical reviewer at NMC. Under the centralized MMC process all mariner medical evaluations will be performed at the NMC.
- Well-defined evaluation and waiver guidelines will expedite submission and approval of examinations. The expectations of mariners, REC staffs, and healthcare examiners need to be in alignment regarding what information needs to be included on the Merchant Mariner Physical Examination Report, Form CG-719K, and what supplemental medical evaluations and tests need to be included.

Completed Project Milestones

Much has been accomplished since the team's charter. The Merchant Mariner Professional Advisory Committee (MERPAC) medical workgroup assisted in drafting the proposed NVIC. Team members met with and reviewed the medical certification processes and lessons learned of Federal transportation mode partners, including the Military Sealift Command, Federal Aviation Administration, and Federal Motor Carrier Safety Administration. The multiple components required for a comprehensive medical evaluation system are being simultaneously addressed.

A seven-person Medical Evaluations Branch was established in West Virginia in December 2006 with a full-time physician, clinical healthcare evaluators, and an administrative staff. Standardized medical evaluation process procedures consistent with the STCW-mandated Quality Standards System (QSS) have been developed and the workflow process has been integrated with the Merchant Mariner Licensing and Documentation Database to provide real-time tracking of medical evaluation status to NMC and the RECs. The International Classification of Diseases (ICD-10) codes for medical conditions have been incorporated into the Coast Guard's licensing database to record mariner medical waivers.

While MERPAC has been of tremendous support, their expertise and experience is not medical and they have numerous other important safety issues to address. A legislative change proposal to establish a medical Federal Advisory Committee has been submitted. In the interim MERPAC chartered a second medical workgroup to continue to refine the medical evaluation guidelines. Improved outreach communications between NMC, mariners, employers, and healthcare providers is a project goal. A Medical Branch page has been established on the Coast Guard Homeport web site which will soon contain a list of medical Frequently Asked Questions (FAQs) along with the NVIC and supplemental outreach documents on MLD medical issues. An e-mail address, MerchantMariner@uscg.mil, has been created for mariners, employers, and healthcare providers to ask medical questions directly to the NMC.

In response to concerns about protected health information NMC developed a policy to discontinue printing mariner medical information on credentials. All REC and NMC personnel who handle mariner health information will also receive annual Health Insurance Portability and Accountability Act (HIPAA) training on correct procedures for protected health information.

While our Federal transportation partners have provided valuable information on their medical evaluation systems, we recognize that mariners have some unique requirements which commercial drivers and pilots do not. With the exception of fatigue, almost no research or data exist specifically addressing the relationship between human factors and mariner medical and physical evaluations. An initiative is underway to establish a maritime human factors research consortium with members from the government, industry, and academic medicine centers, including the National Institute for Safety and Occupational Health and the National Academy of Sciences Transportation Research Board.

NMC Restructuring and Centralization: Changes in Current Processes

The existing MLD medical evaluation system, in which non-medical REC personnel were evaluating medical information on the CG-719K form, is not adequate to ensure maritime safety. The *Robert Y. Love* and *Andrew J. Barberi* mishaps were not isolated cases of missed medical problems. Numerous inconsistencies and deficiencies have been noted at NMC during CG-719K reviews by medical evaluators with clinical education and experience. A comparison of the Coast Guard MLD medical evaluation system with the other Federal transportation modes, such as the Federal Motor Carrier Safety Administration, and with other countries, such as the United Kingdom, shows significant deficiencies. The public expects and deserves a safe maritime transportation system.

The NMC centralization and restructuring centralizes medical evaluations in West Virginia. The NMC Medical Evaluations Branch will review all CG-719K/Es, not just those forwarded for waivers. Evaluations will be done by medically trained professionals. Healthcare examiners will serve as “eyes and ears” and medical data collectors, guided by the NVIC. Unlike the Federal Aviation Administration and Federal Motor Carrier Safety Administration medical programs, the Coast Guard does not presently require healthcare examiners performing MLD physicals to be trained or certified by the Coast Guard. This has resulted in a wide variation in the quality and completeness of mariner examinations, requiring centralized evaluation at the NMC. Mariners are requested to provide relevant consultations by medical specialists to facilitate complete medical evaluations. The majority of mariners have already had these consultations as part of the standard care for the medical condition. This does **not** imply or require that the mariner’s primary healthcare provider can not continue to treat the specific medical condition. It only requires that a specialist for that medical condition be consulted and that the mariner submit a copy of the specialist’s evaluation. While primary care providers often treat these conditions, there is a difference between treating a patient and providing an in-depth evaluation of a condition from which NMC must make a five-year prediction on the mariner’s fitness. These evaluations require the time and expertise of specialists. Again, most mariners have had these evaluations performed as part of their regular medical care.

Navigation and Vessel Inspection Circular “Medical and Physical Evaluation Guidelines for Merchant Mariner Credentials”

The goal of the proposed NVIC is to ensure that mariners are physically and medically competent to safely carry out the demands required of credentialed mariners.

This helps to ensure the safety of the mariner, passengers, and the general public, while allowing the mariner opportunity to maintain his or her credential for employment.

Like a ship, the MLD medical evaluations process is a system built from multiple components. The “keel” of this system upon which everything else is supported is the NVIC. The project team’s first priority was to revise the existing Navigation and Vessel Inspection Circular (NVIC) 2-98, “Physical Evaluation Guidelines for Merchant Mariners’ Documents and Licenses.” The Coast Guard published in the Federal Register a draft to replace the existing NVIC 2-98. The new proposed NVIC is entitled “Medical and Physical Evaluation Guidelines for Merchant Mariner Credentials.” The contents of this NVIC were developed from recommendations and input provided by the Merchant Marine Personnel Advisory Committee (MERPAC) and a subcommittee comprised of experienced maritime medical practitioners.

The revision of NVIC 2-98 is a critical component of the Coast Guard’s response to address current deficiencies in the medical review system. The NVIC is a policy guidance document that interprets and provides guidance on regulatory requirements; it does not contain legally binding requirements of its own. It clarifies existing non-specific regulations for what physical and medical conditions would render an applicant to not be “in good health” or would be a “physical impairment or medical condition” which would render the applicant “incompetent to perform the ordinary duties”. It provides guidance to mariners, employers, and healthcare providers as to what should be considered acceptable “medical fitness” to perform the functions of the job. It lists “potentially disqualifying” medical conditions and medications, and acceptable supplemental medical data which facilitates evaluation for obtaining a waiver.

Why is Revising the NVIC Important?

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW) requires each party to establish standards of medical fitness for seafarers. 46 United States Code, Subtitle II, Part E, and 46 Code of Federal Regulations (CFR) Subpart B require that mariners be physically able to perform their duties, using terms such as “general physical condition,” “good health” and “of sound health.” 46 CFR Parts 401 and 402 contain special requirements for registration as a Great Lakes Pilot, including the requirement to “pass a physical examination given by a licensed medical doctor.” None of these references contain specific standards, with the exception of visual acuity and color vision, for determining if mariners are physically and medically qualified.

Due to the lack of detail in statutes and regulations, the physical and medical standards upon which applicants are evaluated, and the medical tests and other information needed to make these evaluations are often unclear to medical examiners, employers, and mariners. This frequently leads to confusion and unnecessary delays in processing credential applications. The NMC medical evaluation staff often need to have additional information in order to reliably perform the evaluation and predict the medical and physical suitability of a mariner for the five-year period of the MMC.

Coast Guard data on medical waivers submitted to the National Maritime Center from RECs reveals that applications with incomplete medical information take three to four times as long to process. The proposed NVIC will better assist medical providers, Coast Guard REC staffs, and applicants in submitting complete medical information with

the application, thereby avoiding delays in the medical review process. The proposed NVIC provides specific guidance for examining the physical and medical conditions of applicants for credentials. The proposed NVIC lists most medical conditions that are potentially disqualifying, and the data required for NMC evaluation of each condition. It also details specific guidelines for demonstrations of an applicant's physical ability, and acceptable vision and hearing standards. It will reduce the time required to process credential applications by helping eliminate the guesswork as to what specific physical and medical information that mariners may currently encounter.

What are the contents of the proposed NVIC?

The proposed NVIC reflects a synthesis of MERPAC recommendations, regulatory requirements, and the recommendations of leaders of experienced maritime community medical practitioners as to appropriate physical and medical standards to ensure public safety.

Enclosure (1) of the proposed NVIC provides guidance on medical certification standards. It lists the standards that apply to applicants for each of the various types of credentials. Enclosure (2) provides guidance for determining if mariners are physically able to perform their duties. Enclosure (3) contains a list of potentially disqualifying medical conditions and medications, and the supplemental medical data to be submitted for NMC medical review. The medical experts from the maritime community who helped develop these guidelines attempted to define the minimum set of diagnostic and evaluation criteria to ensure an adequate medical review with as little burden on the mariner as reasonably possible. These guidelines will be continuously reviewed by a group of maritime medical specialists and revised as necessary to reflect changes in current medical policy and to ensure they are aligned with the maritime occupational environment. Enclosure (4) contains guidance for evaluating vision and hearing. Enclosure (5) describes the medical review process.

How does the proposed NVIC differ from the current NVIC 2-98?

The current NVIC 2-98 defines approximately forty-seven medical conditions as potentially disqualifying, but provides specific waiver guidance for only two of those conditions. The absence of specific guidelines for waiver submissions has created numerous delays and inconsistencies in waiver reviews. The purpose of the proposed NVIC is to provide amplifying guidance to examiners, mariners, and employers on most potentially disqualifying conditions, the procedures for conducting the medical examination, and the supplemental information which should be submitted to NMC if a medical condition exist.

The proposed NVIC has a more extensive list of medical conditions requiring additional information from credential applicants than does NVIC 2-98. There are significant public safety risks associated with mariners not being physically able to perform their safety-related duties or through sudden incapacitation from a medical condition. Even minor medical conditions can be the root cause of a major maritime mishap. The list of potentially disqualifying conditions is based upon the collective expertise of Coast Guard evaluators and maritime medical specialists and data from previously requested waiver applications. Although the list is more extensive and specific than the list previously published in NVIC 2-98 it reflects medical conditions which are,

and have been, present in the mariner population.

What Has Not Changed

The proposed NVIC does not establish qualified/ disqualified medical evaluation criteria; it only describes the minimum medical database required to make rational medical evaluations. Medical evaluation criteria are seldom absolute, and must take into account numerous factors. Some general evaluation guidelines can be established, and MERPAC is convening another workgroup to assist in developing these. The Coast Guard is also forwarding to the Department of Homeland Security a proposal for a new Federal Advisory Committee to address MLD medical issues separate from MERPAC, who already have an abundance of issues.

The information contained in the proposed NVIC does not change the current Coast Guard physical and medical evaluation process. It puts the current medical evaluation practices into writing, making them more available to mariners and medical practitioners performing the physical examinations. **It is not anticipated that the proposed NVIC will result in significantly higher rates of disqualification for mariners, nor in increased processing time for credential applications with physical and/or medical issues.** To the contrary, the Coast Guard expects the process to be more consistent and less subjective, and that the application processing time will be reduced because all parties will know precisely what information is needed at the outset of the application process. This will become even more critical under centralization, since the RECs will not be screening applications for medical evaluation. The information requested in the NVIC has already been frequently requested by Coast Guard physicians reviewing waivers submitted by the RECs. **Analysis of that data shows a disqualification rate of about one percent, which we do not expect to change significantly.**

The proposed NVIC is not intended to serve as a standard for, nor substitute of, appropriate care by the mariner's primary care provider. There is a difference between the acceptable standard of care in the primary care setting and what is an acceptable medical certification standard for issuance of an MMC. In many cases the Coast Guard needs an evaluation by a medical specialist to ensure a complete medical review, even though the condition may be managed by a primary care provider. The majority of medical evaluations and tests specified in the proposed NVIC would have already been obtained by the mariner's primary care provider as part of the standard of care. Additional evaluations may be required to ensure that the mariner is capable of performing his or her duties. It is common in all transportation modes for specialty evaluations to be required for applicants in safety-sensitive positions who have specified medical conditions. Occasionally this may involve an added expense to the mariner; however, the Coast Guard has an obligation to ensure that the condition has been properly diagnosed, treated, and does not affect the applicant's ability to safely perform his or her duties before issuing a credential. Requiring an evaluation by a specialist to confirm that a condition is under control and does not pose a risk to public safety is a reasonable balance between the individual interests of the mariner and the Coast Guard's mandate to ensure maritime safety. A specialty evaluation does not prevent the primary care provider from continuing to manage the applicant's care. The proposed NVIC requests a consultation and evaluation, not a transfer of care.

Closer medical review of mariner applicants is consistent with the intent of the National Transportation Safety Board (NTSB) recommendations in the report on the 2003 allision of the State Island ferry ANDREW J. BARBERI , and with the Coast Guard's commitment to ensure maritime safety; however, mariners should not experience increased delays in processing credential applications.

Frequently Asked Questions

- *Why Is This a NVIC Versus a Regulation?*

There are several reasons why this guidance is being published through a NVIC and not regulations. First, there is the volume of material which would constitute a large amount of regulatory text. Second, it is very detailed. It is not practical to incorporate the detailed specificity of the medical evaluation into regulations due to the nature of the international, legislative and regulatory processes; however, specific guidance is necessary to reduce the subjectivity of the physical and medical evaluation process and promote more consistent evaluations. Coast Guard regulations do not typically go into this much depth. It has been standard practice in our regulation of the maritime community to provide basic requirements in the regulations, then more specific guidance on those requirements through policy, being sure not to create any new requirement beyond that established in the regulation. Third, and most important, NVICs are easier to update. This is a subject that requires frequent and timely updates to remain current with changes in medical practice, which is difficult to do through the regulatory process. As technology broadens we learn more about medical conditions that can cause marine casualties and incidents, as well as changes in medical practice to evaluate these conditions. It is important that we remain up-to date on these issues and provide timely guidance to our evaluators and the public as to how we should interpret the physical and medical requirements that exist in our regulations.

The increased specificity of the revised NVIC is only to guide applicants and examiners in submitting supplemental documentation to enable a fair and thorough evaluation. It allows for the exercise of discretion. The flexibility to allow for methods of proving ability and to consider operational limitations when warranted and deemed safe is necessary. Strictly requiring only those tests and examinations listed in the NVIC would not allow for new or alternative methods and would lessen the level of service that we provide to our customers. Other transportation modes, such as the FAA and FMCSA, also promulgate their specific waiver guidance to applicants and medical examiners via policy documents outside of regulations. The Coast Guard is in alignment with other Federal transportation modes in this respect.

- *Should mariners with current waivers be “grandfathered”?*

The term “grandfathered” implies an automatic renewal of a previously issued waiver when the mariner applies for an MMC renewal or upgrade. Waivers issued by the RECs under the legacy system often were not based upon sound medical evaluation. The previous system of evaluation by non-medical evaluators at RECs and NMC resulted in some inappropriate waivers and other conditions often being missed. In many cases, unnecessary annual follow-ups were required. Each MMC application or annual physical review under the transition system will be evaluated by NMC. The vast majority of mariners who had been issued waivers will be issued waivers again. Some may have restrictions reduced, or in some cases be told a waiver is no longer necessary. A

mariner's training and experience do not offset the safety risks posed by most medical conditions i.e risk of heart attack.

- *Will there be increased attrition of mariners for medical disqualifications?*

The Coast Guard does not foresee a major increase in medical disqualifications as mariners with existing or new medical conditions renew their MMCs. Recent MMC medical evaluations show a low rate of disapprovals, approximately one per cent. These mariners had significant medical issues and most would not be licensed as a commercial driver by DOT. Under the legacy system the medical evaluation process was primarily performed by Coast Guard physicians whose primary duty was to perform medical fitness-for-duty evaluations on Coast Guard personnel, and often used those standards in evaluating mariners. Under the transitioned NMC centralized review mariners are evaluated against guidelines aligned with the maritime industry. However, not everyone is medically or physically qualified to safely operate in the maritime industry, similar to restrictions placed in other safety-sensitive transportation industries. Maritime safety is the primary consideration. Some have suggested that mariners may have been concealing existing medical conditions and that the rate of disapprovals may increase. The Coast Guard is monitoring this closely and will distribute the data as it becomes available.

- *Do tug and towboat operators have same physical and medical requirements as STCW mariners?*

It is beneficial and logical to align physical and medical requirements with the occupational requirements of the mariner. Unfortunately, the complexity of the MLD system makes it difficult to determine what safety-sensitive functions a mariner must perform based solely on the type of MMC they hold. Enclosures 1 and 2 of the proposed NVIC do not differentiate requirements among mariners holding identical credentials. It does allow issuance of an MMC with operational limitations for mariners who can not meet the physical requirements. The Coast Guard intends to work with MERPAC and the future Merchant Mariner Medical Advisory Committee to develop risk-based stratification criteria based on consequences of mariner human performance decrements to the Marine Transportation System and public safety. Once this is completed it can be implemented in the MMC medical evaluation process. This is a complex endeavor which will take additional time to complete.

- *What will be the monetary costs to mariners and the maritime industry?*

The medical information required for the MLD evaluation process is based upon accepted standards of medical care. The vast majority of information has (or should have) already been obtained by the mariner's primary care provider and/or specialist. Occasionally there is a need for additional evaluation. The medical information required by NMC to certify a mariner as safe to operate for the five-year MMC period is occasionally more extensive than the information needed by the mariner's primary care provider to provide care on a regular basis. Use of board-certified medical specialists is the optimal means for NMC to obtain thorough evaluations of most medical conditions. Often primary care providers do not have the time or ability to provide an in-depth evaluation which a consulting specialist can. A cost analysis of additional tests and evaluations specifically required by NMC is being conducted by the Coast Guard. It will also analyze the extent of these evaluations which are provided by employers' healthcare coverage.

Future Challenges-The Way Ahead

NMC's goal is to develop a medical evaluation system consistent with the "World's Finest Coast Guard." Some of the on-going and future initiatives are:

- *Revision of the CG-719K form*

Concurrent with the NVIC revision, the Coast Guard also expects to revise the CG-719K form, "Merchant Mariner Physical Examination Report," and form CG-719K/E, "Merchant Marine Certification of Fitness for Entry Level Ratings," to better align these forms with the NVIC. This will make it easier for mariners and examiners to include the information prescribed in the NVIC. This process requires Office of Management and Budget (OMB) approval and will take approximately 6 to 9 months.

- *Utilization of the Merchant Mariner License and Document (MMLD) electronic database to track and monitor mariner medical conditions and waivers*

This will allow the Coast Guard to track trends in mariner medical conditions which require waivers using the ICD codes. This information will be used to make changes to program policies and the NVIC as needed.

- *Implement E-government solutions for improved outreach communications with mariners and examiners*

Solutions are being developed for increased use of the Coast Guard Homeport web site and a medical e-mail to "push" information on the medical evaluation process to mariners and healthcare providers. Capabilities for electronic transmission of medical information, compliant with HIPAA requirements for Protected Health Information, are being developed.

- *Utilize advisory committees to establish expert-based waiver approval criteria*

Development of the Coast Guard's medical evaluation criteria is the next phase after publication of the NVIC. This will require input from multi-disciplinary healthcare providers outside of the Coast Guard. MERPAC is continuing to support a medical workgroup until the medical Federal advisory committee is established.

- *Continuously update supplemental medical information and documentation required for waiver applications*

NMC will continuously analyze the medical conditions being evaluated against the guidelines in the NVIC. In addition to using the expertise of the Federal Advisory Committees, NMC is partnering with the other Federal transportation modes and agencies to share the research they have developed on medical evaluations of transportation workers.

- *Stratify guidelines by public safety risks*

It is difficult to categorize a mariner's risk to public safety by medical conditions, since mariners may work in a variety of maritime operations under the same credential. Some broad-based categories are potentially useful in stratifying mariners, which would allow different evaluation criteria to be used for each category. This challenging step will be the focus of future work by the Federal Advisory Committees.

- *Develop a healthcare provider examiner guide*

While the NVIC will be an excellent tool for healthcare providers performing MMC medical examinations, they need to have a more concise and easy to use quick reference. We intend to publish an MMC examiner guide, similar to those published by DOT, and distribute it electronically.

- *Partner with other Federal transportation modes to share medical research & consensus guideline development resources*

Mariners have some unique medical and physical requirements separate from commercial vehicle operators and pilots. There are also many similarities among transportation workers. The efforts and expense to develop research-based data on transportation medical evaluations is significant. Our efforts can be amplified by sharing information. The Coast Guard intends to partner with the National Institute of Occupational Safety and Health, industry and occupational health academic centers to establish a maritime health research consortium.