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Medical Oversight of US Merchant Mariner Applicants: Sleep Apnea

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Objectives

- Overview of the Merchant Mariner Credentialing Process
- OSA and the Merchant Mariner
  - Statistics
  - Current Process
  - Challenges
- The Future
US Merchant Marine

Refers to the fleet of U.S. civilian-owned merchant ships, operated by either the government or the private sector, that are engaged in commerce or transportation of goods and services in and out of the navigable waters of the United States.

The Merchant Marine is responsible for transporting cargo and passengers during peace time. In time of war, the Merchant Marine is an auxiliary to the Navy, and can be called upon to deliver troops and supplies for the military.

- Personnel who operate or work on vessels for commerce.
- Key role in maintaining US economy
- Does not include commercial fishermen.
Merchant Mariner Duties
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Merchant Mariner Duties
### Deck Licenses / Endorsements

<table>
<thead>
<tr>
<th>Master</th>
<th>Chief Mate</th>
<th>2nd Mate</th>
<th>3rd Mate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mate</td>
<td>Mate / Pilot</td>
<td>Apprentice Mate</td>
<td>Able Seaman</td>
</tr>
<tr>
<td>Apprentice Mate</td>
<td>Steersman</td>
<td>Lifeboatman</td>
<td>Tankerman</td>
</tr>
</tbody>
</table>

### Engine Licenses / Endorsements

<table>
<thead>
<tr>
<th>Chief Engineer</th>
<th>1st Engineer</th>
<th>2nd Engineer</th>
<th>3rd Engineer</th>
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</thead>
<tbody>
<tr>
<td>Engineer</td>
<td>Designated Duty Engineer</td>
<td>Assistant Engineer</td>
<td></td>
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<tr>
<td>Machinist</td>
<td>Refrigerating Engineer</td>
<td>Junior Engineer</td>
<td></td>
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<tr>
<td>Electrician</td>
<td>Oiler</td>
<td>Oiler - Limited</td>
<td></td>
</tr>
<tr>
<td>Fireman / Watertender</td>
<td>Pumpman</td>
<td>Deck Engineer</td>
<td></td>
</tr>
<tr>
<td>Deck Engine Mechanic</td>
<td>Engineman</td>
<td>Deck Engine Mechanic</td>
<td></td>
</tr>
</tbody>
</table>
Merchant Mariner Physical Requirements

- Capable of working in cramped spaces
- Long work hours
- Able to participate in emergency procedures- fire fighting, launch life boats, man overboard
- Climb steep or vertical ladders
- Maintain balance on moving deck in bad weather
- Pull heavy fire hoses up to 400 feet
- Open/close water tight doors weighing #56
- Is able, without assistance, to crouch, kneel and crawl
- Able to move through a restricted opening of 24 inches by 24 inches
- Has the agility, strength and range of motion to put on a personal flotation device and exposure suit without assistance from another individual.
Mission Statement:

To ensure a safe, secure, and environmentally sound Marine Transportation System, the mission of the National Maritime Center (NMC) is to issue credentials to mariners who are fully compliant with current regulations in the most effective and efficient manner possible.
Title 46 CFR (Shipping)
Issues all Merchant Mariner Credentials (MMC)
220,000 mariners; 70,000 credentials/yr.
Must hold a valid credential in order to work.
Credentials previously issued by 17 Regional Exam centers (RECs)
Centralized process beginning in 2006, but centralization not completed until 2008.
Merchant Mariner Credentialing Process

3 separate evaluations:

- Safety and Security Branch: background check for arrests, convictions and other criminal activity.
- Professional Qualifications Branch: reviews sea time, approved courses and exams.
- Medical Evaluations Division: reviews physical exam (719K) and supporting medical documents; determines medical fitness for mariner duties.

- Applicant must pass all 3 evaluations.
- Credential is valid for 5 years. Pilots must submit annual exam (719K) to NMC for review.
Medical Evaluations Division:

- Medical evaluations has grown from a branch with 4 people, to a full division of 35 people within the last 3 years:
  - Three physicians, 14 physician assistants
  - Staff of clerks and Certified Medical Assistants
  - One Medical Administrator, 1 Program Analyst, 2 Health System Specialists, 1 Administrative Assistant
Mariner Medical Evaluation Process

- Evaluation performed/document on standardized 719K CG form by US-licensed MD, DO, PA, or NP only and submitted to REC for inclusion in mariner application package
  - Development of Designated Medical Examiner Program has been identified as a priority and we are actively exploring this program element

- 719K marked competent, not competent, or needs further review.

- NMC does not conduct physical exams
Mariner Medical Evaluation Process

Administrative review of 100% of examinations done by the National Maritime Center (NMC)

Files undergo tiered review: Not all physicals require evaluation by NMC higher-level medical evaluators.

- Less than 30% of all physicals require mid-level provider review
Medical Denials

- Less than 2% of all applicants
- Entitled to due process under the law
  - Reconsideration request to NMC
    - submit all new/mitigating evidence
  - Appeal to CG Headquarters;
    - final authority
    - Provides oversight of NMC 6 by CG 54; “2nd opinion”
46CFR 10.215: Standards

Only specific standards are related to vision and hearing:

Vision: both acuity and color perception
- Different for deck officers vs. others
- Color vision different as well

Hearing: If abnormal, then needs functional speech discrimination testing and audiometric testing
- Waivers granted for hearing aids
- “Abnormal” not spelled out: if examiner “has concerns”
Mariner Medical Standards

- No legal requirement for a Mariner to report a change in medical condition after physical exam.

- NMC does not issue a separate medical certificate at this time.
  - Creation of a separate medical certificate is anticipated with our current proposed rulemaking which has just undergone the public comment phase.
Mariner Medical Guidelines

NVIC 04-08

- Navigation and Vessel Inspection Circular
- Medical and Physical Evaluation Guidelines for Merchant Mariner Credentials
- Available at www.uscg.mil/nmc/ medical information tab
Mariner Medical Guidelines

NVIC 04-08

- Medical conditions subject to further review and recommended evaluation data
- Non-exhaustive guidance document which identifies over 200 medical conditions subject to further review and provides recommended evaluation data.
- Guidance, not standards, little medical decision-making guidance included: Revision is pending...
Mariner Medical Issues

- Diabetes (IDDM and NIDDM ~20%)
- Cardiac: (~11%)
  - ischemia
  - cardiomyopathy
  - implantable cardioverter defibrillator (ICD)
  - pacemaker
- Conditions requiring chronic use of Narcotic or Benzodiazepine medication (~10%)
- Sleep apnea (~1-3%)
- Morbid obesity, BMI > 40 (~10%)
Mariner Medical Issues

- Psychiatric (~12%)
  - depression/anxiety
  - bipolar
  - psychoses
- Insomnia and hypnotic medication use (~5%)
- ADD/ADHD and stimulant Rx use (~5%)
- Substance abuse/dependence (~4%)
- Seizure disorder (~2%)
Fatigue and Mariners

- Considerable variation in work schedules
- No mandated work hour rules at this time
- Our mariner population reflects the US general population in its medical concerns such as obesity/HTN which can impact OSA risk
Mishaps have occurred in the past where fatigue and OSA have been postulated as possible exacerbating factors.

- Star Princess in 1995: OSA may have contributed to poor performance
- Cosco Busan in 2007: OSA known/treated, but CG had not requested documentation on treatment adequacy.

These incidents led to NTSB recommendations to the USCG and changes within our credentialing process:

- OSA-specific symptoms added to 719K physical exam/history form
- Evaluation of treatment efficacy/compliance
- Providing education and guidance for mariners w/OSA
Mariners and OSA

- Current process for the evaluation of Sleep Apnea include the submission of the following:
  - Diagnostic polysomnogram (PSG)/Titration Study within the last 5 years
  - Demonstration of Compliance with treatment
    - Prefer compliance logs
    - Will accept Maintenance of Wakefulness Test (MWT) if no log capability
  - Coast Guard does not currently require mariners to be screened for OSA
Mariners and OSA

Current process for the evaluation of Sleep Apnea include the submission of the following:

- If condition was treated with surgery, then a post-operative sleep study is requested to document condition resolution.

- Treatment with mouth guards or positional therapy also requires submission of a PSG while using the device to demonstrate efficacy of treatment.

- Mariners required to submit interval evaluations with compliance information annually to maintain credential.
Obstructive Sleep Apnea

- Stimulant medication use:
  - Do not routinely allow use of stimulants for OSA treatment
  - Concerns include side effects, abuse potential, severity of underlying condition, etc.
  - Credentialing done on a case by case basis.
The Future

- Our current program priorities include:
  - Development of Designated Medical Examiner Program
  - Revision of the NVIC 04-08
  - Development of Medical Expert Panels to address maritime safety issues associated with various conditions like OSA
  - Improvements to our current Mishap database and Investigating Officer training programs to better capture/investigate medical causal factors

- Future plans include working with our newly formed Merchant Mariner Medical Advisory Committee (MMMAC) toward these goals.
Summary

- Maritime environment is quite varied/one size does not fit all

- Fatigue is an issue in the maritime community

- Our program is still developing

- Our goals for the future are to continue to improve our process and increase our outreach and education of mariners and stakeholders concerning issues of fatigue and sleep disorders
Questions?