Safety Within the U.S. Navy

Editor’s Note: B.J. Penn is the Assistant Secretary of the Navy for Installations and Environment and as chief of safety for the Department of the Navy (DON). In this interview, Penn outlines the Navy’s goals and milestones and explains how safety concepts are promoted to Navy leadership and personnel.

PSPS: What are your role and responsibilities as Assistant Secretary of the Navy and as chief of safety for DON?

B.J.P: As the Assistant Secretary of the Navy for Installations and Environment, I am responsible for formulating policy and procedures for the effective management of Navy and Marine Corps real property, housing and other facilities, environmental protection and safety and occupational health for both military and civilian personnel. I report directly to the Secretary of the Navy, Donald Winter.

I also serve as the department’s designated safety and health official (DASHO) to OSHA. I provide the executive oversight to DON’s safety and occupational health program and implement this oversight responsibility through my Deputy Assistant Secretary for Safety, Tom Rollow.

I have the responsibility to protect the safety and health of approximately 1 million sailors, Marines and DON civilian employees. I view all of our senior leaders, including the Chief of Naval Operations and the Commandant of the Marine Corps, as “safety chiefs.” Our leaders are responsible for the safety and well-being of our people, our most precious asset.

PSPS: Describe the Navy’s current safety and occupational health (SOH) staffing and resources. How are SOH practices maintained and enforced among all Navy personnel and how does the Navy monitor SOH practices on ships and submarines?

B.J.P: Staffing and resources for the Navy and Marine Corps consist of approximately 1,500 civilian SH&E professionals assigned to bases in the U.S. and around the world. Ships, aviation squadrons and ground units also have trained uniformed safety officers assigned.

The Naval Safety Center (www.safetycenter.navy.mil), augmented by the Marine Corps Safety Division (http://hcinet001.hmc.usmc.mil/sd/index.htm), consists of approximately 255 Navy, Marine Corps and DON civilian personnel who provide tools, analysis, investigative support and policy guidance to the DON safety program.

DON subscribes to the philosophy of integrated safety management where safety is integral with the work. Hence, we consider all of our operators to also be safety staff.

The Navy monitors safety primarily through the use of metrics such as lost workdays, accidents and injuries. We recognize that these are lagging indicators continued on page 4
History of Risk Management
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In modern notation, the theorem is:

\[ P(C \mid E) = P(C \cap E) / P(E) \]

Today, there is a school of mathematical analysis named after Bayes, called
Bayesian statistics and probabilities. What most textbooks on statistics and
probabilities fail to tell their readers is that four different schools of statistics and
probabilities exist and members of the various schools have total disdain for
members of the other schools, as will be shown in the next installment of the history
of risk management. (Gigerenzer et al., 1989).

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Mold Contamination Risk Reduction

By Dan Mahoney, CIH, CSP, & Jerome Spear

Uncontrolled growth of mold and bacteria indoors can expose employees and occupants to unhealthy conditions, result in property damage and impair the use of buildings. Although the compensability of exposure to indoor mold is often debatable, the response to and defense of these claims can consume resources. Since mold and bacteria are naturally present in indoor environments, the recognition of those factors that promote their growth indoors is critical to control their amplification. The key to biological contaminant control is to prevent water from entering the building and to control the relative humidity inside.

Water Intrusion

Roof leaks, plumbing leaks or sewer backups which allow water into the structure are often the triggering event that leads to a mold and bacteria problem. Water intrusion that occurs during construction and renovations is also associated with uncontrolled mold growth. The key to control is preventive maintenance of building systems as well as regular inspections to identify leaks. Thorough planning before construction activities is critical to avoid moisture from entering the structure.

Consideration should be given to protecting construction materials from precipitation once they are delivered to the site. Additionally, building openings should be protected when possible to reduce the amount of moisture that enters the interior of the structure during the construction process.

Local weather conditions influence the degree of mold risk. Buildings located in areas with high precipitation or persistent high humidity must defend against the outdoor conditions. To control indoor mold growth, humidity should be kept below 60% relative humidity. Properties located within flood plain areas may also need special design considerations such as sump pumps, moisture barriers and exterior grading to prevent rising surface and groundwater from entering the structure.

Properties in the 100-year flood plain should be evaluated for suitability. Basements and crawlspaces that are persistently high in humidity can be sources of mold within the structure which can damage stored contents and building structure integrity.

Interior moisture sources can also contribute to humidity levels within the struc-
ture. Indoor pools, spas, laundries or other wet processes add a significant moisture load. Heating, ventilation and air conditioning (HVAC) systems must be designed to handle the excess moisture load to remove the moisture from the structure.

Buildings that have a history of water leaks present a higher degree of mold risk. Persistent small leaks that are not resolved, such as small roof leaks or leaks around window frames, are commonly associated with uncontrolled mold growth. More extensive leaks that take longer than 2 days to clean up and to dehumidify the area are also high-risk indicators.

If porous or semiporous materials have been wetted and remain within the building, these materials are likely to harbor mold growth. Buildings constructed of biodegradable materials are also likely to harbor biological activity, as the building envelope and structure members can absorb moisture.

### Building Maintenance

Preventive HVAC maintenance, plumbing and other building systems can reduce the potential for mold growth. Building owners that disregard HVAC maintenance of basic components such as filter changes and condensate drains are at increased risk. HVAC systems that cycle off during non-occupancy hours to save energy can result in fluctuations in temperature and humidity conditions, which may promote mold growth. Undersized and oversized HVAC systems are also associated with inadequate moisture control.

### Visible Mold Growth

The New York City Department of Health has published Guidelines on Assessment and Remediation of Fungi in Indoor Environments. These guidelines help define the potential degree of risk and provide suggested cleanup methods based on the extent of damage and the building materials involved. They outline general abatement strategies based on the square footage of moldy area. The levels are defined as follows:

- **Level I:** Small isolated areas (10 sq ft or less)—e.g., ceiling tiles, small areas on walls.
- **Level II:** Mid-sized isolated areas (10 to 30 sq ft)—e.g., individual wallboard panels.
- **Level III:** Large isolated areas (30 to 100 sq ft)—e.g., several wallboard panels.
- **Level IV:** Extensive contamination (greater than 100 contiguous sq ft in an area).

*Level V: Remediation of HVAC systems.*

Additionally, EPA’s document, “Mold Remediation in Schools and Commercial Buildings,” provides guidance on cleanup methods, PPE and type of containment suggested.

### Cleanup Methods

If mold growth has been a problem in the past or if remediation has occurred, the cleanup methods used can indicate the probability of a reoccurrence. If cleanup was slow to occur (more than 2 days) after the leak and if it was limited to air drying and vacuuming up water, the cleanup may have been inadequate. Cleanup should include:

- Discarding water-damaged porous and semiporous materials.
- HEPA vacuuming.
- Containment of work areas.
- Dehumidification.
- Clearance inspections and sampling.

### Reducing Mold Risk

The New York City Department of Health guidelines, citing ASHRAE 55-1992, suggest that:

In all situations, the underlying cause of water accumulation must be rectified or fungal growth will recur. Any initial water infiltration should be stopped and cleaned immediately. An immediate response (within 24 to 48 hours) and thorough cleanup, drying and/or removal of water-damaged materials will prevent or limit mold growth. If the source of water is elevated humidity, relative humidity should be maintained at levels below 60% to inhibit mold growth. Emphasis should be on ensuring proper repairs of the building infrastructure so that water damage and moisture buildup do not recur (Section 3, Remediation, Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health).

To reduce the risk of indoor mold contamination, consider the following when purchasing and managing properties:

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**TABLE 1 Common Indoor Molds & Health Hazards**

<table>
<thead>
<tr>
<th>Mold &amp; Fungi Species</th>
<th>Health Impact</th>
<th>Where Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternaria</td>
<td>- Asthma</td>
<td>- Aging plants</td>
</tr>
<tr>
<td></td>
<td>- Eye infections</td>
<td>- Cellulose tiles and wallpaper</td>
</tr>
<tr>
<td>Aspergillus</td>
<td>- Severe allergic lung disease</td>
<td>- Decaying leaves</td>
</tr>
<tr>
<td></td>
<td>- Fumiga</td>
<td>- Damp lining of HVAC systems</td>
</tr>
<tr>
<td></td>
<td>- Flavus</td>
<td>- Warm environments</td>
</tr>
<tr>
<td></td>
<td>- Niger</td>
<td>- Where freestanding water is available</td>
</tr>
<tr>
<td>Cladosporium</td>
<td>- Very common allergic responses</td>
<td>- Tile grout, bathroom sealants</td>
</tr>
<tr>
<td>Penicillium</td>
<td>- Fungal infections</td>
<td>- Ceiling with condensed water from pipping</td>
</tr>
<tr>
<td>Mucor</td>
<td>- Pathogenic rarely</td>
<td>- Cold temperatures</td>
</tr>
<tr>
<td></td>
<td>- Systemic infections</td>
<td>- Refrigerated food spoilage</td>
</tr>
<tr>
<td>Cryptococcus</td>
<td>- Infections</td>
<td>- Very common in air</td>
</tr>
<tr>
<td>Neoforhans</td>
<td>- Can progress to meningitis</td>
<td>- Grow on sugar and starches</td>
</tr>
<tr>
<td></td>
<td>- Target AIDS patients</td>
<td>- Pigeon and chicken droppings</td>
</tr>
<tr>
<td>Histoplasma</td>
<td>- Infections</td>
<td>- Guano fertilizer</td>
</tr>
<tr>
<td>Capstalatum</td>
<td>- TB-like lung disease</td>
<td>- Soil containing bird and bat droppings</td>
</tr>
<tr>
<td>Stachybotrys</td>
<td>- Debatable/health effects</td>
<td>- Damp cellulose materials</td>
</tr>
<tr>
<td>Chartarum</td>
<td>- Fatigue, rashes, headache, nausea, coughing, diarrhea</td>
<td>- Greenish black appearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Water damaged areas</td>
</tr>
</tbody>
</table>
Mold Contamination

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• Avoid basements.
• Do not locate in a flood plain.
• Any visible mold should be <10ft².
• Design to handle excess humidity sources.
• Maintain roofs and plumbing systems to prevent sudden or chronic leaks.
• Choose nonbiodegradable building materials.
• Avoid properties that have a history of water leaks.
• Ensure that recent renovations did not allow water intrusion or use wetted construction materials.
• Ensure that HVAC systems are maintained and run continuously to control temperature and humidity levels.
• Any cleanup should be performed within 48 hours using documented processing for containment dehumidification and disposal of wet porous and nonporous materials.

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