NWU under fire

A new report raises safety concerns, claiming NWUs would melt on sailors in fires

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If every sailor is a firefighter, as the Navy proudly states, then every sailor is in danger.

A new Navy report concludes the Navy working uniform "will burn robustly until completely consumed." The cotton fibers in its 50/50 cotton/nylon blend burn while the nylon fibers "melt and drip." The report continues: "If this sticky, molten material came in contact with skin it would contribute to increased burn injury."

Worse, the Navy has no ready alternative. The standard Navy coveralls worn underway by most afloat commands are made of similar material with nearly identical properties, textile experts told Navy Times.

Only the NOMEX engineering coveralls and flight suits offer any kind of flame-resistant properties among shipboard uniforms.

Navy officials in Washington played down the report, which was completed for Naval Sea Systems Command in October by the Navy Clothing and Textile Research Facility in Natick, Mass.

"This was an impromptu test; it wasn't a long, planned scheduled test," said Rear Adm. John Kirby, the Navy's top spokesman. And its findings, he continued, "reinforced what we already knew of the Type I uniform, which is it's not flame-resistant… nor was it intended to be."

MC2 CHRIS WILLIAMSON/NAVY

A sailor wearing Navy working uniform trousers grinds a weld while deployed aboard a submarine tender in October 2011. Navy regulations say sailors engaged in such work should "wear only flame-retardant clothing."

The blue digital NWUs were never rated as flame-resistant. That requirement was dropped for Navy working uniforms in 1996 when the Navy was developing a successor to the unpopular but traditional dungarees-and-chambray shirt combination that had been used since World War II.

Naval history is rife with fires that killed sailors and crippled ships. Devastating fires raged on carriers Forrestal and Enterprise, the frigate Stark, and in the past four years, aboard the carrier George Washington, dock landing ship Whidbey Island and the drydocked attack submarine Miami.

Two years ago, the Navy suspended the sale of its blue T-shirts — designed to be worn under NWUs — out of concern that they could melt in intense heat and even fuse into a wound. Shirts were recalled and replaced with a new, cotton version that doesn't melt.

The Navy's other camouflage utility uniforms, the digital desert and woodland patterns, may also be made of a 50/50 nylon cotton blend. Those uniforms are not flame-resistant, the Navy confirmed. By contrast, the Army and Marine Corps have required fire-retardant uniforms for years due to concern about improvised explosives in the war zones. But those features are costly: The flame resistant Army combat uniform costs $54 more than the non-flame-resistant version.

Sailors serving downrange also have access to flame-resistant organizational gear.

When news broke of the NWU burn test,

'What's going to happen if there's a fire?'

By Sam Fellman
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The Navy working uniform's 50/50 blend of nylon and cotton is known in the industry as NYCO. It has many advantages as a fabric, including strength and moisture-absorption, but textile and fire-safety experts cautioned this material has one huge downside: inability to withstand heat.

"I was shocked when I looked at this report," said Hoon Joo Lee, a textile engineering expert at North Carolina State University, who reviewed the recent Natick flame test results. "I can't believe the Navy is using NYCO for their working uniform. What's going to happen if there's a fire on the ship?"

Lee, who has consulted the Army on combat uniforms, explained that NYCO lacks flame-resistance because the cotton burns and the nylon melts, a combination that renders the fabric unfit for proximity to heat or flame. Nylon is a synthetic material, like polyester, whose thermoplastic fibers are produced from petroleum. Heat melts these fabrics.

Depending on the blend, nylon melts at temperatures as low as 374 degrees, Lee said.

"You don't want to go too close to fire wearing this," Lee added.

And yet that's exactly what the Naval Safety Center declared was OK last year.

Safety officials cleared the fleet last year to fight fires in NWUs, especially in the critical moments after a fire is first discovered — when you have the best chance to extinguish it.

"The urgency for immediate response demanded by a shipboard fire requires that a sailor wearing the NWU be prepared to attack a newly discovered fire in order to extinguish the fire or prevent fire spread," the Naval Safety Center said in an Oct. 6, 2011, safety advisory. "In other words, initial response can be in the NWU uniform."

Neither fleet officials nor the Naval Safety Center had revised this guidance as of Dec. 14.

Utility coveralls, the blue uniform worn throughout the fleet, will also melt and burn in a fire, said two textile and fire experts consulted by Navy Times. This uniform has 65/35 polyester-cotton fabric and is not treated with a flame-resistant coating. That's the only thing that could keep this uniform from melting and burning, they said.

Dr. Peter Hauser, a textile chemist at North Carolina State University, reviewed the utility coveralls fabric specifications provided by the Defense Logistics Agency.

"Polyester is a thermoplastic polymer just like nylon," Hauser told Navy Times, adding that he has worked for years to develop flame-resistant treatments for these fabrics. "If it's not treated, it's going to burn and melt and drip."

Another expert agreed. If this fabric was also flame tested, it would almost certainly exhibit the same characteristics as the NWUs, said Guy Colonna, a chemical engineer with the National Fire Protection Association. It has two issues, he explained: "One, it doesn't exhibit fire-resistance characteristics, and two, it shouldn't be used as a primary garment for people who are expected to be routinely in and around the potential for fire."

Blazes are best fought by expert fire crews, such as the ship's "flying squad" of damage controlmen, outfitted in the Navy's fire-fighting ensembles, complete with coat, helmet, flash gear and durable boots. Since NWUs lack flame-resistance, they are not suited for fire-fighting and may only be appropriate for putting out a trash can-sized fire.

Hauser said it was probably OK to fight a small fire, the kind that could be doused with a handheld extinguisher.

"But if you're talking about a whole compartment on fire," he continued, "then it'd be a different situation. Or if for example, you had an aviation fuel fire, which would be a lot more intense. Then you wouldn't want somebody wearing this to be involved."

Hauser compared nylon melting to superhot melted candle wax. Chemists are working to develop flame-resistant treatments for nylon that would prevent melting and

[TELLUS]

Are you concerned about the quality of your working uniform? Did you know it wasn't flame resistant? What should the Navy do about this test? Email your thoughts to **navylet@navytimes.com**

sailors were angered and dismayed that their uniform won't protect them in fire.

"Shouldn't this have been one of the first tests before the uniform was issued out?" asked one sailor, in an online comment typical of hundreds posted after Navy Times broke the story on Dec. 12. "This is unbelievably unacceptable."

The Navy routinely refers to its shipboard spaces as industrial environments, with all the inherent risks they entail, including the risk of fire.

Fire safety experts said the Navy's current guidance, which clears sailors to fight fires in NWUs, may be unsafe. And a textile engineer told Navy Times she was "shocked" that the Navy was using a nylon-cotton blend for its working uniform, since the melting qualities of nylon are well-known.

The Navy launched a social media counteroffensive after the initial story broke, calling the finding that NWUs melt "#NoSurprise." They argued sailors knew that NWUs weren't safe in a fire, despite more than 100 comments to the contrary sent to Navy Times via email, message boards, Facebook and Twitter.

"I had no idea that the uniform was so dangerous in a fire," wrote Capt. Joel Rothschild in an email. "Quite frankly, I am extremely disappointed in Navy leadership that they did not conduct this type of testing before adopting the uniform; or if they did, that they proceeded with approving it for shipboard use."

Indeed, the new findings appear to contradict the Navy's own guidance when the uniforms were introduced. In 2005, uniform officials said NWUs met "fire-retardant standards" and could withstand "intense heat without causing injury."

Navy officials defend the current uniform and say sailors are not in danger. There is no record of a sailor suffering burns exacerbated by the NWU.

The revelations have also called into question the coveralls, an alternative uniform worn on most ships by the entire crew when underway. Textile experts said these would also burn and melt when exposed to flame, basing their judgment on the uniform specifications.

Officials said the Natick findings are being evaluated and that current offerings of flame-resistant uniforms, such as flight suits, engineering coveralls and firefighting gear, are adequate to cover the risks in ships and squadrons.

"We believe based on the current fleet requirements that the uniform remains adequate to service on ships at sea," said Kirby, the Navy's chief spokesman. "We are willing to review the requirement and that's where we are right now."

Asked why the Navy hasn't immediately recalled the NWUs or suspended their use as it has in similar cases, Kirby responded: "Well, I think we want to better understand the whole issue here. Safety remains a paramount concern of ours for our sailors, particularly those at sea. And again, we believe we have it right when it comes to what organizational clothing our sailors are issued at sea."

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dripping, he said. But as it stands, the test shows this uniform is not suited to fight fires, said Hauser and another fire safety expert who reviewed the Natick test results.

The NWU "doesn't provide fire resistance characteristics and performance and therefore shouldn't be used in that kind of environment," said Colonna. "If the condition of their work activity is to respond to fires, it would seem that based on these test results, that's counter to the ability of the actual uniform to survive that kind of environment."

Another risk: Sailors encounter flammable substances all the time. They can be in anything from the paint and cleaners found in storerooms and paint lockers to the fuel and oil in engine rooms. If flammable substances aren't carefully removed from the garment, they can put the wearer at risk of having the uniform ignite, Colonna explained.

Sailors in NWUs are at risk of fighting fires in that uniform and will only be better protected by flame-resistant clothing, including garments such as the fire-fighting ensembles, flight suits and engineering coveralls.

NWUs, when worn under the fire-fighting ensemble, would likely be safe, said Colonna, a former Coast Guard officer who added that the Navy needs to provide sailors with updated guidance on what's safe.

"There needs to be some conversation in terms of education for everybody about the differences and the protection that they have and the level of risk or the level of hazard that they escalate through as they go through these different levels of clothing," Colonna said.

To many in the fleet, the news that NWUs melt feels like a step backward, a sign that the Navy has forgotten the lessons after hundreds of deaths from devastating shipboard fires, one commander said.

"I would think that fire-resistance would have been the number one criteria for evaluation a new working uniform," said Cmdr. Andrew Thaeler, who's assigned to the Naval Postgraduate School, in an email to Navy Times. How is it that the [Marine Corps] and Army have safer uniforms given the much higher risk of fire in [Navy] shipboard environments?

"We need to move to a fire-resistant uniform immediately," he added. "After reading this report, I'd feel much safer wearing [a Flame Resistant Army Combat Uniform] on a ship than NWUs." □

YourNavy

New sex-assault prevention film encourages sailor intervention

By Mark D. Faram
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DAM NECK, Va. — There's a new movie coming to a command near you — and if you're E-6 or below, you're required to see it.

But before you start to groan about yet another military training class, you might just like this one.

It's called "Take the Helm," and it's 40 minutes long. It's also the centerpiece of the Navy's new Sexual Assault Prevention and Response — Fleet, or SAPR-F, training.

There won't be a test, but the Navy's leadership hopes you'll talk about it.

"This is designed to be a two-way conversation with our sailors," said Capt. John Newcomer, commanding officer of the Navy's Center for Personal and Professional Development Command.

"It's a discussion that we hope will instill in our sailors trust and confidence that their command will act appropriately when presented with a sexual-assault report."

The scenario takes place on a fictitious destroyer — the Rupert Wheeling — but could happen, and probably has happened, at any command in the Navy. It was filmed on a real Navy destroyer with actors in the main roles and sailors serving as extras.

In the film's plot, a new female junior petty officer checks into her first sea command and a male first class takes an undue interest in her. Though their shipmates see problems, and peers and leaders try to step in, the situation deteriorates and tears apart friendships and work relationships. The plot has enough holes in it to prompt discussion in the class, which officials are hoping for.

The video begins and ends with Chief of Naval Operations Adm. Jon Greenert and Master Chief Petty Officer of the Navy (AW/NAC) Mike Stevens discussing how serious sexual assault is, that it is a crime that can fracture commands. Each encourages sailors to get involved to prevent it.

The overarching theme of the training is bystander intervention: In other words, to get sailors to act when they see sexual harassment at their command. If sailors trust their commands to do the right thing, Newcomer said, they're more likely to intervene with their shipmates.

That's why, Newcomer said, the class is required to be given by an officer and chief team. The officer must be either an O-3 or 0-4 and the chief can be either an E-7 or E-8, but can't have more than 15 years of service.

"We are encouraging COs to pick their most dynamic people to lead this training," said Cmdr. Stuart Rivers. "The paygrade requirement is there to ensure these facilitators are closer in age to the E-6 and below they're interacting with — but the key is that they be dynamic enough to be able to connect with their sailors and get them to speak openly and freely about this difficult subject matter."

NAVY

This is a still from the Navy's 40-minute film "Take the Helm," part of the service's sexual-assault prevention training for E-6 sailors and below.

The Navy reported 496 alleged incidents of sexual assault in fiscal 2012, which ended Sept. 30. Of those, 397 were "blue on blue" cases involving only Navy personnel. More than half of all the reports involved alcohol.

Officials suggest that class sizes be limited to the department, division or work center levels with no more than 20 to 30 sailors to better foster communication.

As detailed in NAVADMIN 336/12 released Nov. 14, everyone in the Navy, E-6 and below, must complete the training by March 31. Officials had originally hoped to have the training developed and delivered by Dec. 31, but there were delays in getting the content and instructors out to the fleet to train the command teams. □

NWU

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The Navy appears to have limited options to replace NWUs in operational settings. One option would be to boost the buy of flame-resistant engineering coveralls. Other options include treating all new NWUs with a flame-resistant coating or issuing new flame-resistant fabrics entirely.

It would cost the service roughly $20 million a year to phase in one flame-resistant uniform for every sailor, based on the Army's increased cost when they went with a flame-resistant uniform. The four-star commanders of Fleet Forces Command and Pacific Fleet are now heading the review. Both declined interview requests, as did the chief of naval personnel.

"The fleet commanders have established a working group and are now evaluating the proper steps to take in light of the test results," said FFC spokesman Lt. Cmdr. Brian Badura. "It's too soon in the process to offer any tangibles. Safety does remain a paramount concern for us and sailors can be sure that as things develop, we will keep them informed."

There are no reports of NWUs melting and harming sailors, according to the records of the Naval Safety Center.

But in light of sailors' concerns and the Natick report, Congress is looking into the issue.

"The House Armed Services Committee is reviewing this issue to ensure that our sailors have the right tools, including proper uniforms, for successful missions," said Rep. Randy Forbes, R-Va., the chairman of the seapower subcommittee, in a statement.

The test

Researchers tested the blue NWU uniform in mid-October as part of a larger electrical safety review. In the Natick test, engineers hung 3-by-12-inch strips of NWU material alongside strips of flame-resistant Army and Marine uniforms, exposed them to flame for 12 seconds and observed the results.

The Army and Marine combat uniforms tested were made of "flame-resistant" materials, the industry term for fabric proved to self-extinguish and that will not melt. They didn't burn after the flame was removed, experienced no melting and were only charred from 3 to 4 inches.

But the NWUs ignited. The entire strip burned and nylon fibers melted.

"All material samples totally consumed by robustly burning flames," the observers noted in their report, adding that the uniform burned for longer than 60 seconds after the flame was removed.

That finding appears to contradict what uniform officials told the fleet in 2005, when the service wear-tested four versions of the NWUs. All of them were made of 50/50 nylon-cotton blends, the same fabric used today.

The Navy Uniforms Matters office published a frequently asked questions article on Jan. 13, 2005. One of those questions: "What about shipboard fire safety?"

The answer, noting that no seabag item was "developed purposefully" to fight fires, goes on to say that, "Navy uniforms are required to meet specific fire retardant standards and these NWU concepts also meet those requirements.

"The uniforms were developed keeping in mind that our sailors must have a uniform that, if necessary, can help resist a certain degree of intense heat without causing injury," it added.

Uniform officials were unable to say whether flame tests were ever conducted on the NWU or coveralls.

But in the rush to release new camouflage uniforms in the past decade, the Navy would not have been alone in producing a new outfit without fully testing it. The Army, for example, was found to have ignored tests that showed its pale green Army Combat Uniform was inadequate to the job. Both the Air Force Airman Battle Uniform and Army ACU were banned in Afghanistan, replaced with a different pattern and a lighter weight uniform.

A spokeswoman for the chief of naval personnel did not respond to requests for comment on the flame test and said the head of the Uniform Matters office, who had overseen this 2005 release, was unavailable for an interview.

Will there be a recall?

In 2010, Navy officials recalled a half million blue T-shirts when it was discovered that the shirts posed a melting hazard. The Navy already had a suitable and readily available alternative: 100 percent cotton shirts on sale in uniform stores.

But recalling the NWU is not so simple because there is no alternative in hand.

One possible option: Engineering coveralls. These are made of cotton treated with flame-resistant coating. The Defense Logistics Agency purchases roughly 8,000 pairs of these coveralls annually, which the Navy issues as organizational clothing to those who work in engine plants.

The Navy lifted its requirement that shipboard uniforms be flame-resistant in 1996, saving $12 million, which officials at the time planned to use to improve non-fire-retardant uniforms. In the opinion of Navy leaders at the time, the improved protection was not commensurate with a 60 percent increase in cost. When the Navy made this decision, no message was ever distributed to the fleet, an official with Navy Personnel Command confirmed. Navy Times wrote an editorial that year cautioning that fire protection should remain a concern. Since then, the Navy has not extensively researched newer and less expensive flame-resistant fabrics for shipboard use.

Also in 1996, the chief of naval operations directed that future uniforms be manufactured using either a 65/35 polyester-cotton blended material or pre-shrunk cotton denim, non-fire-retardant materials with fire-retardant qualities. But when the NWU was fielded, the Navy switched to a 50/50 blend of nylon and cotton.

The fabric and guidance provided to sailors also differs markedly from that used in industry, said one nuke who left the Navy in August and now works in a power plant.

"When I separated and got a job at a power plant they made it perfectly clear that I was only to wear 100 percent cotton while working in the plant to prevent my clothes from melting to me in the event of a fire or steam line rupture," said Christina Biagetti, a former chief electronics technician, in an email to Navy Times. "It never occurred to me that my NWUs in the Navy could have melted."

"I find it sad that my new company has more concern for my safety than the military did," she added. □