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Daily Press

Chinese New Year

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The top products

Brand managers, marketers and American shoppers have voted. Which items are Parade's Products of the Year? **Inside**

THE REPORT

The NASA Engineering and Safety Center, headquartered at NASA Langley Research Center, investigated the life support system of the F-22 Raptor. A redacted copy of the report was obtained by the Daily Press through a Freedom of Information Act request. Some of its major findings:

OXYGEN LEVELS

NASA recommends adjusting oxygen levels in relation to altitudes. However, the Air Force says it wants to seek more data before making those changes.

THE INVESTIGATION

The Air Force initially considered different components of the Raptor as separate systems. However, the problem of oxygen supply in the cockpit was a complex interaction of several systems working together. The Air Force may not have grasped that idea early on.

THE RESPONSE

The Air Force developed protocols to deal with unexplained "physiological incidents," but different bases had specific approaches that proved beneficial. That information wasn't shared across the Air Force.

STRESS ON PILOTS

Some pilots described how ear blockage clears in the middle of the night, waking them to the sound of a large explosion. Some also say it takes them a couple of days to recover from the fatigue of a flight.

KAITLIN MCKEOWN/DAILY PRESS PHOTO

YOUR RIGHT TO KNOW

Get more investigative journalism from the Daily Press, including stories about problems with the Raptor, at dailypress.com.

Above: An F-22 takes off from Langley Air Force Base on Tuesday.

STUDY TAKES CRITICAL LOOK AT F-22 ACTIONS

Report bolsters Air Force findings, but also cites flaws with how military responded

BY HUGH LESSIG
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HAMPTON — A recently declassified NASA report suggests the Air Force could have more effectively investigated problems with the F-22 Raptor and responded to pilots who experienced symptoms of oxygen deprivation or hypoxia.

The report also "concur[s] with much of what the Air Force has done" to determine why the expensive, stealthy jet has caused some pilots to feel dizzy or disoriented.

However, it cited a lack of information sharing and approaches to treating pilots that varied from base to base. It also took a critical look at how the Air Force examined the problem early on in its attempt to find the elusive "smoking gun."

NASA completed the 120-page report in August 2012. The Daily Press recently obtained a redacted copy through a Freedom of Information Act request.

Among the highlights:
 NASA recommends adjusting oxygen levels in relation to altitudes. However, the Air Force says it wants to seek more data before making those changes.

The Air Force developed guidelines to treat

See RAPTORS/Page 8

YOUR MONEY

Paper check a thing of past

Are you one of the millions of people who are still collecting a paper Social Security check? Get ready to make a change soon. The paper check is supposed to go away by March. **Page 1 of Your Money**

SPORTS

Back in pool after scare

York High School swimmer MaryElizabeth Warhol has national-class talent and Olympic ambitions. But she almost didn't survive toxic shock caused by a rare bacterial illness. **Page 1 of Sports**

GOOD LIFE

It's an Oscars marathon!

You can see all nine of the Best Picture nominees — that's 20 hours and 19 minutes worth of cinematic entertainment — in an Academy Awards blitz at AMC Hampton Towne Centre 24 on Feb. 16 and Feb. 23. **Page 1 of Good Life**



IMAGE COURTESY OF THE MARINERS' MUSEUM

Becalmed off Old Point Comfort shortly after the British blockade of the Chesapeake Bay in February 1813, the six-gun schooner Lottery put up a ferocious two-hour fight before surrendering to Royal Marines.

WAR COMES TO HAMPTON ROADS

War of 1812: Fear grips the countryside as British ships enter the Chesapeake Bay on a mission to blockade, raid and burn

BY MARK ST. JOHN ERICKSON
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No one could mistake the intent of the British warships that appeared at the mouth of the Chesapeake Bay early on the frosty morning of Feb. 4, 1813.

Just one of the immense 74-gun ships in this advance squadron boasted more firepower than all the cannons defending the Elizabeth River in Norfolk — and within weeks the number of tall masts and Union Jacks commanding the waters between Lynnhaven Bay and Old Point Comfort would multiply many times over.

Not for several days, however, did the nature of the threat become clear to mariners, shopkeepers, farmers and militiamen sizing up His Majesty's might from afar.

About noon on Feb. 8, a lookout aboard the HMS Maidstone spotted a sail approaching from the northwest. An hour later, after eluding several smaller British ships, the six-gun schooner Lottery out of Baltimore found itself becalmed off Old Point and beset by a swarm of enemy vessels.

That's when the first cannon shots rang out, signaling the start

See WAR/Page 8

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Campaign of fire, plunder, fear

War

Continued from 1

of the War of 1812 in Hampton Roads.

Heard as far away as Norfolk, the ferocious two-hour battle sparked a panic as residents loaded carts with furniture and raced to escape a feared invasion. But the thundering sound was merely the first salvo in a campaign of fire, plunder and fear that would terrorize Tidewater and the bay for two years.

Bent on punishing the United States for declaring war the previous June, the Royal Navy would seize or burn hundreds of vessels, launch scores of hit-and-run raids and pillage untold numbers of farms and towns in an iron-fisted answer to the Times of London's demand that "America must be BEATEN INTO SUBMISSION!"

"The War of 1812 is a forgotten war — but it shouldn't be," says Newport News historian J. Michael Moore, a contributor to the forthcoming book "Tread of the Tyrant's Heel: Virginia's War of 1812 Experience."

"For two years, the British raided up the James River as far as Lawnes Creek and Jamestown. They raided Warwick County. They attacked Norfolk. They burned and plundered Hampton. They marauded up the bay, attacking Maryland and Baltimore and burning Washington.

"In the Chesapeake Bay, the British showed they could do just about anything they wanted. And if it wasn't for the Civil War, this is the war we'd be talking about today."



IMAGE COURTESY OF THE ROYAL MUSEUMS, GREENWICH

British Rear Adm. George Cockburn was reviled in America for burning Hampton and other Chesapeake Bay towns during the War of 1812. But he was celebrated in Britain, with this post-war painting showing him standing before the flames of Washington, D.C.

"It was a pretty close call," says Williamsburg historian Stuart L. Butler, retired assistant branch chief of the National Archives' Military Archives Division and author of the new book "Defending the Old Dominion: Virginia and Its Militia in the War of 1812."

"He almost didn't escape — and he knew he could never take on a force like that in battle."

A call to arms

That was the same conclusion Lt. Col. Henry Howard of York County reached after debriefing a cavalryman who had seen the British fleet come in and assemble some 8 miles from his post at Buckroe.

Sizing up his volunteers from Elizabeth City, York and James City counties in the face of this dire threat, Howard warned Gov. James Barbour on Feb. 5 that the "situation is truly alarming."

"The Militia of the 115th Regiment (are) not half of them armed and without a cartridge to defend themselves..." he reported.

"I do not know of a single barrel of powder that can be procured on any terms."

Despite such widespread un-

the problem. It lifted the stand-down after four months even though investigators did not determine what specifically caused the problem.

Last year, the Raptor made national headlines when two pilots from the Virginia Air National Guard based at Langley told "60 Minutes" they were not comfortable flying the aircraft, even though they believed in it. That spurred Sen. Mark R. Warner to get involved, and it led Defense Secretary Leon Panetta to impose flight restrictions and demand the installation of an automatic backup oxygen system.

Later in the year, Air Force leaders announced they believed the problem had been largely solved through a combination of measures. One key fix involved a pressure vest meant to inflate during periods of intense acceleration, known in pilot parlance as pulling high Gs. The vest was inflating at the wrong time, which restricted breathing. Pilots were told not to wear the vest while the valve was redesigned.

Last month, Raptor pilots began flying with vests again, using a newly designed valve. Pilots have reported no problems, and the Air Force cleared pilots to fly at 52,000 feet, up from a restriction of 44,000 feet, said Lt. Col. Tadd Sholtis, a spokesman for Air Combat Command.

The Air Force has not logged an unexplained hypoxia incident since March 2012.

The service asked NASA in May 2012 to review the Raptor investigation, as well as the protocols the Air Force established to deal with the incidents. Leading

More online

Go to dailypress.com to see a gallery of images from the War of 1812.

preparedness, Barbour called out some 2,000 militiamen on Feb. 6, ordering them to muster at Williamsburg and Smithfield before deploying to defend Hampton and Norfolk.

In addition to riflemen from Elizabeth City, York and James City counties, the force included Gloucester artillery and Williamsburg cavalry as well as units from Isle of Wight, Nansemond, Norfolk, Princess Anne and as far as Orange, Patrick, Pendleton and Culpeper counties.

Though poorly trained, equipped and provisioned, these farmers, tradesmen and shopkeepers would defend Hampton Roads largely without regular army troops, who President James Madison decreed couldn't be spared from the invasion of Canada.

"It can't be expected that I can defend every man's turnip patch," Madison insisted.

Still, under Brig. Gen. Robert

the probe was NASA's Engineering and Safety Center, which pulled in experts from throughout NASA.

The 14-member team included four people from NASA-Langley, including the team leader.

Oxygen and altitude

The NASA team lists "high concentrations of oxygen at lower levels" as something that could have led to breathing problems. Restricted breathing combined with previous problems regarding the upper pressure garment worsened the problem.

Sholtis said adjusting the oxygen schedule of the Raptor — the concentration of oxygen at different altitudes — is something that merits further study, but the Air Force isn't necessarily buying NASA's recommendation.

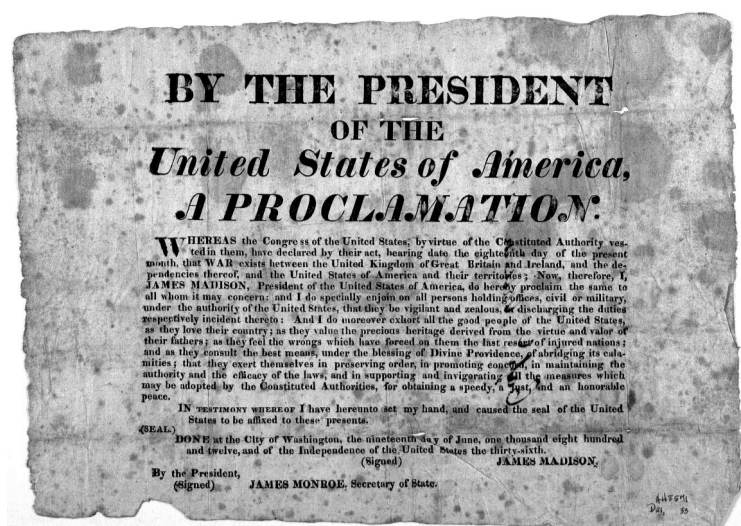
"Although NASA and others point to the effects of too high a concentration of oxygen at lower altitudes, there are factors that argue against a rush in that direction," Sholtis said last week.

He said experts also point to the advantages of "pre-breathing" higher oxygen levels before climbing to high altitudes — which happens quickly in a Raptor.

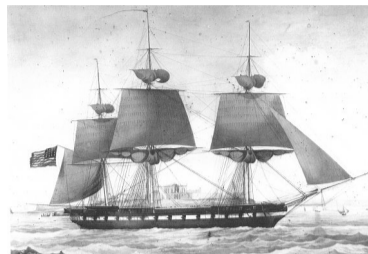
"And many Navy pilots have been flying on 100 percent oxygen for years with no known impact on safety or health," Sholtis said. "So we're seeking more information and consensus among experts before we adjust that schedule."

Different approaches

NASA recommended the estab-



The U.S. declared war on Great Britain in June 1812, prompting the Royal Navy blockade of the Chesapeake Bay early the following year.



The 38-gun frigate USS Constellation narrowly evaded capture by the British blockade fleet by dragging itself across a becalmed Hampton Roads with the aid of its boats and anchors. IMAGE COURTESY OF THE NATIONAL ARCHIVES

Barraud Taylor, a prominent Norfolk attorney born in Smithfield and educated at the College of William and Mary, the American defenses at Norfolk became more organized and formidable than expected.

Working closely with Stewart and his crew, Taylor reinforced the artillery batteries overlooking the Elizabeth River at Forts Norfolk and Nelson with a third series of guns at Craney Island commanding the river's mouth. Then Stewart bolstered this new position by transforming the Constellation and 19 gunboats into a floating wall that blocked both the channel and the flats.

Guns and gunners from the frigate made Craney Island still stronger, as did Army Corps of Engineers Capt. Walter K. Armistead, who improved the earthworks at Taylor's invitation.

"It would have been a disaster if the British had taken Norfolk," Butler says.

"But Taylor was quite an organizer, and he had great oratorical skills. The governor thought he was the perfect man for the job — and it seemed that he was."

Blockade, raid, burn

Looking on from as close as Newport News Point, the British fleet continued to grow, adding four more massive ships of the line as well as numerous frigates and sloops of war to a force that all but shut down American shipping.

So effective was their blockade that Virginia's exports collapsed, dropping from an annual figure of \$3 million to \$17,000.

"Not a vessel can pass from Hampton Roads, either up or

division's responsibility and its availability to consult with F-22 bases in our Medical Response Plan," Sholtis said.

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Cartoonists lampooned initial British efforts in the War of 1812. But the tide soon turned against the American invasion of Canada and its lax defense of the Chesapeake Bay.

down the bay without being intercepted," the Richmond Enquirer reported. "Not a vessel bound for sea can escape capture."

Still, as the British commanders learned from their frustrating failure to capture the Constellation, their largest, most heavily armed ships faced strict handicaps in the shoal waters of the Chesapeake, making it impossible to exploit their firepower near the shores.

They also discovered right away that the bay's shifting sands made it tricky as well as shallow.

"The utmost possible endeavors and perseverance were exerted night after night by all the boats of the squadron to find and buoy off ... the channel into Elizabeth River," reported Rear Adm. George Cockburn, whose charts were all outdated or mistaken.

"But so intricate and difficult is it that all our efforts proved vain."

Cockburn soon invented the weapon he needed, however, to begin carrying out the raids that led to the burning of Havre de Grace, Md., and Washington, D.C., as well as the "rape of Hampton."

Loading as many as 2,500 Royal Marines and infantrymen into scores of shoal-draft boats — each one bristling with oars — he soon found himself commanding a dangerous amphibious attack force that could strike virtually anywhere it wanted.

"This was an unusual concept back then," says historian Gordon B. Calhoun of the Hampton Roads Naval Museum, describing the fear that gripped the countryside as the assaults began.

"But the British were here to raid and burn — and Cockburn was the perfect person to prosecute that kind of offensive.

Raptors

Continued from 1

pilots with unexplained cases of hypoxia. However, different bases tried specific approaches that, while beneficial, were not shared throughout the service. The Air Force said what NASA deems as inconsistency could be seen as being flexible.

The report describes pilots with ear blockages that clear in the middle of the night, "waking them up to the sound of a loud explosion." Other pilots describe how it takes "a couple of days" to recover from the fatigue of a flight. In response, the Air Force says pilots in many aircraft complain of delayed ear blocks, and the condition is not unique to the F-22. As for fatigue, the Air Force says NASA's observations were made before improvements reduced breathing stress among pilots.

The investigative process generated much information, but didn't necessarily lend itself to the challenge posed by the Raptor, which required not only examining individual systems, but how those systems interacted.

Back story

Raptor pilots began experiencing unexplained symptoms of hypoxia as early as 2008. Most incidents happened at Langley Air Force Base in Hampton and Joint Base Elmendorf-Richardson in Alaska, the NASA report says.

In 2011, the Air Force grounded the entire fleet as it investigated