



# FACT SHEET

Office of the  
Assistant Secretary of Defense (Health Affairs)  
**Deployment Health Support Directorate**

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## **Deseret Test Center Project SHAD**

### **High Low**

Project Shipboard Hazard and Defense (SHAD) was part of the joint service chemical and biological warfare test program conducted during the 1960s. Project SHAD encompassed tests designed to identify US warships' vulnerabilities to attacks with chemical or biological warfare agents and to develop procedures to respond to such attacks while maintaining a war-fighting capability.

The primary purpose of the High Low test was to assess the vulnerability of ships to an enveloping cloud of toxic G-series nerve agent. The test had two primary objectives. Objective one was to investigate the penetration of a simulant for the nerve agent Sarin (GB) into four types of naval ships operating at sea. Objective two was to estimate the penetration of Sarin into the four types of operational naval ships by evaluating the results of Objective one in conjunction with the Sarin/Sarin-simulant relationship established in Flower Drum, Phase I (DTC Test 64-2.) This was done mathematically, no Sarin was used in this test.

Methylacetoacetate was used to simulate Sarin nerve agent. The simulant was disseminated from a modified Model T-45M-2 MARS Portable Gas Turbine located on the bow of the test ship. All personnel (ships' crews and civilian test personnel) were instructed in the use of protective masks, and masks were worn by personnel directly exposed to significant quantities of methylacetoacetate.

The Department of Defense (DoD) is providing this information, at the request of the Department of Veterans Affairs (VA), to assist the VA in providing healthcare services to qualified veterans and to assist veterans in establishing service connection for disability claims. The Deployment Health Support Directorate (DHSD) collected this information from multiple sources and requested that the military services declassify it to allow its public distribution. The VA accepts this information provided on location, dates, units and/or ships, and substances involved in this exercise, which DHSD extracted from classified DoD records, and will provide it to individual veterans as necessary, but the VA cannot verify its accuracy.

The ships which operated in High Low were the USS *Berkely* (DDG-15), the USS *Fechteler* (DD-870), the USS *Okanogan* (APA-220), and the USS *Wexford County* (LST-1168).

High Low tests were conducted in the Pacific Ocean off the coast of San Diego, California, during the period January 11 through February 26, 1966.

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<b>Test Name</b>	High Low (DTC Test 65-13)
<b>Testing Organization</b>	US Army Deseret Test Center
<b>Test Dates</b>	January 11 – February 26, 1966
<b>Test Location</b>	Testing was conducted in the Pacific Ocean, off the coast of San Diego, California
<b>Test Operations</b>	To assess the vulnerability of ships to an enveloping cloud of toxic G-series nerve agent.
<b>Participating Services</b>	U.S. Navy, Deseret Test Center personnel
<b>Units and Ships Involved</b>	USS <i>Berkely</i> (DDG-15) USS <i>Fechteler</i> (DD-87) USS <i>Okanogan</i> (APA-220) USS <i>Wexford County</i> (LST-1168)
<b>Dissemination Procedures</b>	Agent cloud was generated by dissemination from a modified Model T-45M-2 MARS Portable Gas Turbine located on the bow of the test ship.
<b>Agents, Simulants, Tracers</b>	Methylacetoacetate
<b>Ancillary Testing</b>	Not identified
<b>Decontamination</b>	Not identified
<b>Potential Health Risks Associated with Agents, Simulants, Tracers</b>	<p><u>Methylacetoacetate (MAA)</u> This compound was used as a simulant. While acute exposure has been associated with irritation of skin, eyes, respiratory tract, and digestive tract, there is little or no evidence of long-term or late-developing health effects and it is not known to cause cancer in animal testing.</p> <p>(Sources: NLM TOXNET, Methyl acetoacetate 105-45-3, HSDB Human Health Effects and Animal Toxicity Studies, available at <a href="http://toxnet.nlm.nih.gov">http://toxnet.nlm.nih.gov</a>. <a href="http://hazard.com/msds/tox/f/q4/">http://hazard.com/msds/tox/f/q4/</a>)</p>

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[q936.html](#) [as of January 28, 2002] and  
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resources/studenttools/dl/e\\_mmsds.pdf](http://www.hbcollege/chem/lab/organic/gilbert3e/resources/studenttools/dl/e_mmsds.pdf))

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