

SAFETY ALERT



Safety Alert 334
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Benzene Level Exceeds Exposure Limits



During the conduct of two recent offshore production platforms inspections, BSEE inspectors and offshore personnel have been exposed to potentially hazardous levels of benzene. Benzene is a normal, naturally occurring component of petroleum.

- During one inspection, the BSEE inspector noticed continuous venting of gas from a flotation unit. Benzene warning signs were in place. The operator was cited for failing to monitor emissions (and thus benzene levels) to adequately determine if the area was safe for operations personnel.
- During a separate inspection, benzene warning signs were present but the operator could not provide data regarding the benzene concentration present in the production fluids. Subsequent testing showed elevated levels of benzene. The operator failed to properly notify and educate personnel on safe work practices regarding benzene. Safe Work practices failed to address the necessary mitigation and administrative actions needed when monitoring individuals that may have higher benzene exposure.

Due to the low level of understanding the hazards and mitigations associated with benzene, BSEE recommends that operators consider the following options:

- Review this Safety Alert with all personnel to make them aware of the hazards associated with benzene and other similar volatile organic compounds.
- Operators should create a Safe Work Practice or enhance an existing practice to cover benzene control technology, personal protective equipment, exposure limits, and monitoring and maintenance of personnel who have had excessive exposure.
- Special consideration should be emphasized when operators are handling production fluids during operations including draining fluids from vessels, analyzing shake out samples, performing Surface Safety Valve (SSV) and Flow Safety Valve

(FSV) testing and performing maintenance such as replacing glycol socks and charcoal filters.

- Limit time spent working near atmospheric vent hatches on atmospheric vessels, unless the benzene hazards are known and properly mitigated through worker education and respiratory protective equipment.
- All atmospheric vents and venting due to testing of safety valves should take into consideration the personnel breathing zone. Proper venting location as well as proper respirators should be considered for personnel protection.
- Create a schedule of testing and monitoring for benzene and **other volatile organic compounds** and share results with affected personnel.

Relevant benzene exposure tables:

OSHA 1910.1000 Table Z-2

Substance	8 Hour Time Weighted Average (TWA)	Acceptable Ceiling Concentration	Acceptable maximum peak above ceiling for 8Hr Shift	Maximum duration for maximum peak
Benzene	10 ppm	25 ppm	50 ppm	10 minutes

Acute Benzene Exposure Consequences

Noticeable irritation of eyes, nasal passages and throat
Redness, dryness, cracking and peeling of skin depending on exposure concentration
Effects similar to those of other solvents including but not limited to dizziness, skin irritation, eye irritation

Chronic Benzene Exposure Consequences

Leucopenia	Reduced white blood cell count
Thrombocytopenia	Reduced platelet count
Anemia	Reduced red blood cell count
Pancytopenia	Reduced white and red blood cell count with decreased hemoglobin
Decreased bone marrow function	
Aplastic Anemia	Bone marrow ceases to function
Acute Myeloid Leukemia	Reduced production of white blood cells, red bloods cells and platelets--- CANCER

A **Safety Alert** is a tool used by BSEE to inform the offshore oil and gas industry of the circumstances surrounding an accident or near miss. It also contains recommendations that should help prevent the recurrence of such an incident on the Outer Continental Shelf.