

Fatalities in Oil and Gas Extraction (FOG): Key FOG Variable Descriptions



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Key FOG Variable Descriptions

Incident level variables:

Activities

Break or rest

Cementing

Chemical handling

Coiled tubing activities

Drilling during workover activities

Drilling fluid mixing and pumping

Drilling, pulling, or running tubulars

Lay down or pick-up

Make up or break-out

Racking back

Other

Unspecified activity

Equipment assembly or dismantle

Fishing

Hot oiling

Hotwork and welding

Housekeeping and cleaning

Equipment

Rig

Tanks or other vessels

Other

Unspecified

Lease operation

Material handling

Manual

Powered equipment

Office and administrative activities

Perforating

Plug drill out

Pressure pumping

Pressure testing

Production rig activities

Repair or maintenance

Equipment

Flowlines

Rig

Separation equipment

Tanks

Tubulars

Vehicle

Rigging up or down

Setting packers or plugs

Snubbing

Spotting

Swabbing

Tank opening, gauging, or sampling

Tank refurbishment and custom fabrication

Training

Transport

Fluids

Equipment, proppant, or supplies hauling

Other types of cargo

Unspecified cargo

Travel

Aircraft

Light duty vehicle (commuting, non-traditional)

Light duty vehicle (on-duty)

Light duty vehicle (unknown)

Other (rail, bike, animal, etc.)

Water vehicle

Well cleanout

Well control equipment activities

Wellhead or pumping unit activities

Well kill

Wellsite construction or upkeep

Well testing or logging

Wireline and slickline activities

Phase of Operation

Casing Installation

Drilling Operations

Emergency Operations

Exploration

Plug and Abandon Well

Production

Site Preparation and Construction

Unknown

Unspecified: Off-Wellsite

Unspecified: Roadway

Unspecified: Wellsite

Waste Fluids Treatment and Disposal

Well completion: Flowback

Well completion: Hydraulic Fracturing

Well Completion: Other

Well Servicing, Intervention, or Workover

Yard Operations

Worker level variables:

Event type

Contact injuries

- Caught between or crushed
- Struck against
- Struck by
- Struck by falling object

Electrocutions

Explosion (combustion) or fire

Explosion (pressure)

Exposure

- Alcohol or drug overdose
- Cardiac event (possible work exposure)
- Environmental
- Harmful substance
- Hot or cold objects
- Undetermined (possible work exposure)

Fall

- From height
- Same level (slip or trip)

Intentional acts

Overexertion

Vehicle incident

- On-site
- Other location
- Roadway
- Unspecified location

Events with no known work exposure

- Cardiac event (no known work exposure)

Unknown

Industry group

Oil and gas extraction industry groups ("upstream" sector)

- Operating company (NAICS 211120 and NAICS 211130)
- Drilling company (NAICS 213111)
- Servicing company (NAICS 213112)

Examples of other industry groups that do work in upstream oil and gas extraction

- Other specialty trade company (NAICS 2389)
- Specialized freight company (NAICS 4842)
- Commercial and industrial machinery and equipment rental and leasing company (NAICS 5324)
- Geophysical surveying and mapping company (NAICS 541360)

Other Variables

Working alone

Working on-site unobserved

Years of industry experience

Key FOG Variable Descriptions

The FOG database collects several different types of information (i.e. variables) on each fatal incident and each worker who died in the incident. Variables about the incident are those that would be common to all fatalities associated with the incident, such as the date the event occurred and location of incident. Other variables are specific to each fatally injured worker, such as the worker's age, years of experience, and cause of the fatality.

Below are the definitions for key FOG variables, these are the most commonly reported variables in FOG datasets, publications, and products.

Incident level variables:

Activities

Activities are tasks or steps within operations and can be carried out many times and during several different operations. Each incident is assigned as many activities as appropriate to adequately characterize the event. In some cases, it may not be possible to identify the activities crews were engaged in due to the limitations of available data.

The definition of each FOG activity is below.

Break or rest

Includes all tasks related to taking a break or rest from work activities. This includes small impromptu breaks and extended off-duty or on-call downtime or rest at wellsite accommodations.

Cementing

Includes all tasks related to primary cementing of the casing and secondary cementing (e.g. zone isolations and squeezing). Cement mixing and pumping, and transportation, assembly, operation, testing, maintenance, and disassembly of cementing and pumping equipment are examples of tasks conducted during this activity.

Chemical handling

Includes all tasks related to the use or transfer of chemicals (liquids, powders, etc.) used for upstream oil and gas processes.

Coiled tubing activities

Includes all tasks related to conducting coiled tubing activities (inserting a continuous string of flexible steel tubing into the wellbore for a variety of purposes).

Drilling during workover activities

Includes all tasks related to drilling where the operation is not Drilling Operations.

Drilling fluid mixing and pumping

Includes tasks related to mixing, testing, and pumping of drilling fluid. This includes operation, maintenance, and repair of drilling equipment (mud tanks and agitator, shale shaker, pressure pumping equipment, desander, desilter, degasser, etc.).

Drilling, pulling, or running tubulars

Lay down or pick-up

Includes all tasks related to moving tubulars (tubing, drill pipe, casing, collars, rods, etc.) from the horizontal position off the rig to the vertical position on the rig (pick up) or from vertical position on the rig to the horizontal position off the rig (lay down) using automated or manual equipment.

Make up or break-out

Includes all tasks related to making up and breaking out tubulars (tubing, drill pipe, casing, collars, rods, etc.), using manual or power tongs on a rig (drilling, workover, well servicing, etc.). This includes setting or pulling the slips, latching or unlatching the elevators to tubular, making a connection, stabbing, screwing or unscrewing the tubular with the tongs, and moving the pipe between the mousehole and wellbore.

Racking back

Includes all tasks related to standing up tubulars (tubing, drill pipe, rods, etc.) on the rig floor for storage.

Other

Includes all miscellaneous tasks that occur during drilling, pulling or running pipe. This includes waiting, monitoring, etc.

Unspecified activity

Includes activities that occur during drilling, pulling or running pipe where there is not enough information in the FOG data sources to determine the step in the process.

Equipment assembly or dismantle

Includes all tasks related to installation, assembly, and dismantling equipment for any oil and gas extraction operations. Excluded is assembly and dismantling of rigs (see [Rigging up or down](#)) and assembly and dismantling during vehicle maintenance (see [Repair or Maintenance: vehicle](#)).

Fishing

Includes all tasks related to fishing activities (recovering lost or stuck equipment or objects from the wellbore).

Hot oiling

Includes all tasks related to hot oiling activities (circulating heated fluid into tubulars or tanks to remove residues such as paraffin and tar-based oils).

Hotwork and welding

Includes all tasks related to a fire or spark producing activity including welding, flame cutting, brazing, grinding, burning, or using fire or spark producing tools.

Housekeeping and cleaning

Equipment

Includes all tasks related to general onsite or offsite cleaning and washing of equipment.

Rig

Includes all tasks related to general onsite or offsite cleaning and washing of rigs.

Tanks or other vessels

Includes all tasks related to general onsite or offsite cleaning and/or decommissioning of wellsite fluid storage tanks (crude oil, produced fluids, flowback, etc.).

Other

Includes all tasks related to general onsite or offsite cleaning of miscellaneous items used in the upstream oil and gas industry.

Unspecified

Includes all tasks related to general onsite or offsite cleaning and washing of unspecified items.

Lease operation

Includes all tasks related to routine and daily operations of oil and gas well and lease equipment in order to monitor equipment performance and optimize oil and gas production.

Material handling

Manual

Includes all tasks where material (pipe, equipment, supplies, etc.) is moved on-site (wellsite, yards, or shops) manually without the help of powered equipment or vehicles.

Powered equipment

Includes all tasks where a crane, forklift, winch truck, rig up truck, man lift, rig floor hoisting equipment, or other similar powered equipment is used to move material (pipe, equipment, supplies, etc.) or people on-site (wellsite, yards, shops, etc.). Excluded is long distance transportation of material (see [Transport](#)).

Office and administrative activities

Includes all activities related to administrative work including computer work, paperwork, and mail sorting.

Perforating

Includes tasks related to perforating (piercing the casing and cement by detonating explosives in the wellbore to allow formation fluids to flow into the casing or liner).

Plug drill out

Includes all tasks related to drilling out plugs (object, device, or substance used to seal the wellbore).

Pressure pumping

Includes all activities related to pressure pumping (injection of fluids or substances into the wellbore) including transportation, rig up, testing, operation, monitoring, maintenance, and rig down of pressure pumping units.

Pressure testing

Includes all tasks related to pumping of high-pressure fluid into an open formation to determine permeability of the rock formation, or to determine safe operating pressures of piping and pressure vessels. (also called Pressure Integrity Test, Leakoff testing)

Production rig activities

Includes all tasks related to the transportation, rig up or down, operation, testing, and maintenance of a production rig (workover rig, well servicing rig, pulling unit, etc.).

Repair or maintenance

Equipment

Includes all wellsite and off-wellsite tasks related to repair or maintenance of oil and gas extraction equipment.

Flowlines

Includes all activities related to repairing or maintaining flowlines such as removing paraffin or oil-based tars from the well bore and flowlines.

Rig

Includes all wellsite and off-wellsite tasks related to repair or maintenance of oil and gas extraction rigs.

Separation equipment

Includes all tasks related to the operation, repair, and maintenance of equipment used for separating production fluids (separators, heater treaters, sand separators, etc.).

Tanks

Includes all wellsite and off-wellsite tasks related to repair and maintenance of fluid storage tanks (crude oil, produced fluids, flowback, etc.).

Tubulars

Includes all wellsite and off-wellsite tasks related to repairing or maintaining tubing, casing, collars, drill pipe, and rods (including polishing rod), and production tubing after installation.

Vehicle

Includes tasks related to impromptu or planned repair or maintenance of vehicles used primarily for oil and gas extraction operations. This includes maintenance or repair that is carried out in a facility dedicated to vehicle repair or maintenance or by a worker whose primary job is vehicle repair or maintenance (i.e. a mechanic). This also includes unplanned repair or maintenance of vehicles (e.g. changing a tire) at wellsites or during transport activities.

Rigging up or down

Includes all tasks related to preparing an oil and gas rig (drilling, workover, etc.) and related equipment for operations on the wellsite (rigging up). Also includes all tasks related to dismantling an oil and gas rig and related equipment once operations using the equipment have been completed (rigging down).

Setting packers or plugs

Includes all tasks related to the process of placing a stopper or plug in the well for the purpose of isolating a section of the wellbore or stopping well flow. This process may be for the setting of temporary or permanent plugs within the wellbore. Plugs may be composed of cement, composites, or other materials.

Snubbing

Includes tasks related to snubbing including transportation, rig up, testing, operation, monitoring, maintenance, and rig down of snubbing units.

Spotting

Includes all tasks related to spotting or directing traffic at oil and gas workplaces (wellsite, yards, shops, etc.).

Swabbing

Includes all tasks related to swabbing including transportation, rig up, testing, operation, monitoring, maintenance, and rig down of swabbing units.

Tank opening, gauging, or sampling

Includes all activities related to opening tank hatches, measuring fluids, or collecting samples from wellsite storage tanks (crude oil, produced fluids, flowback, etc.).

Tank refurbishment and custom fabrication

Includes all activities related to storage tank (crude oil, water, flowback, produced water, etc.) refurbishment and custom fabrication. This operation is distinguished from other storage tank activities in that the worksite is dedicated to and the workers' primary occupation is tank refurbishment and custom fabrications.

Training

Includes all activities related to training, including pre-work meetings (toolbox talks, tailgate meetings, etc.), classroom training, simulations, on-the-job training, and drills.

Transport

Fluids

Includes all tasks related to the transport and transfer of fluids by motor vehicles including, vehicle travel, impromptu maintenance, and wellsite tasks. Excluded are gauging, thieving, and sampling.

Equipment, proppant, or supplies hauling

Includes all tasks related to the transport of proppant, supplies, and stand-alone equipment. This includes securing and unsecuring cargo, vehicle travel, and impromptu vehicle maintenance or repair. Examples of cargo for this activity include drilling rigs, sand, tubulars, and well site equipment. Excluded is the transport of equipment that is integral to the vehicle (e.g. hot oiling truck, vacuum truck, truck mounted service rig).

Other types of cargo

Includes all tasks related to the transport of cargo by vehicles that is not defined by any other FOG activity.

Unspecified cargo

Includes all vehicle transport where the cargo cannot be determined by any FOG data sources.

Travel

Aircraft

Includes all operator and passenger tasks related to travel that is done in an aircraft. Travel by helicopter is an example of this type of travel.

Light duty vehicle (commuting, non-traditional)

Includes all tasks of the driver and passengers during nontraditional commutes. FOG defines a nontraditional commute as meeting one of the following criteria: 1) worker travel in excess of 90 minutes or 50 miles one-way, 2) workers transported by an employer-paid transportation service, and 3) workers traveling as a crew.

Light duty vehicle (on-duty)

Includes all on-duty driver and passenger tasks related to over the road travel in a motor vehicle. Excludes the transportation, loading, and unloading of fluids, equipment, supplies, proppant, etc. (See [Transport](#)).

Light duty vehicle (unknown)

Includes all driver and passenger tasks related to over the road travel in a motor vehicle where the type of travel is unknown.

Other (rail, bike, animal, etc.)

Includes all operator and passenger tasks related to travel that is done in a vehicle other than a motor vehicle, aircraft, or water vehicle.

Water vehicle

Includes all operator and passenger tasks related to travel that is done in a water vehicle. Travel by barge or boat are examples of this type of travel.

Well cleanout

Includes all tasks related to removing materials from the wellbore (paraffin, sand, scale, organic materials, etc.). Excluded is fishing (see [Fishing](#)).

Well control equipment activities

Includes all tasks related to the installation, testing, operation, monitoring, maintenance, and dismantling of well control equipment (blowout preventer, frac stack, accumulator, choke manifold etc.).

Wellhead or pumping unit activities

Includes all tasks related to the installation, operation, testing, maintenance, and dismantling of the wellhead, christmas tree, pumping unit, and related equipment.

Well kill

Includes all tasks related to intentionally killing a well (preventing the flow of reservoir fluids) during planned or contingent operations.

Wellsite construction or upkeep

Includes all tasks related to maintaining the physical wellsite (e.g. vegetation or snow removal) and any construction on the wellsite. Excluded is the maintenance or assembly of wellsite equipment (see [Repair or maintenance: equipment](#), or [Equipment assembly or dismantle](#)).

Well testing or logging

Includes all tasks related to the systematic recording of data to discern downhole characteristics.

Wireline and slickline activities

Includes all tasks related to electrical and slickline wireline activities (lowering of mechanical tools into the wellbore) including the transportation, operation, monitoring, and maintenance, of wireline equipment.

Phase of Operation

Operations are distinct stages or processes in oil and gas extraction. In FOG, each incident is assigned one operation. In instances where more than one operation is occurring, precedence will be given to the operation that primarily contributed to the fatal event. In some cases, it may not be possible to identify the operation due to the limitations of available data.

The definition for each FOG operation is below. (note: the definition does not define the technical terms (see [Resources](#) for this information).

Casing Installation

Includes all activities related to installing casing. This includes transportation of casing, equipment, and personnel, running casing (e.g. conductor pipe, liner string, surface casing, intermediate casing, and production casing), installing casing tools (e.g. casing running tool) and accessories (e.g. centralizers, scratchers, guide shoe, float collars, and bottom and top plugs), cementing of casing, and circulating of drilling fluid through the casing. Excluded is repair of casing and liners after installation (see [Well Servicing, Intervention, or Workover](#)).

Drilling Operations

Includes all activities related to drilling the wellbore. This includes transportation, operation, and maintenance of the drilling rig and equipment, rig up and down, mud mixing and pumping, drilling ahead, tripping pipe in or out, coring, logging activities, and drill stem testing. Excluded is casing installation (see Casing Installation).

Emergency Operations

Includes all activities related to controlling an emergency situation. Generally, these activities are carried out by companies specializing in these operations. Control of a blowout, leak, or other catastrophic event, remediation, and cleanup are examples of activities included in this operation.

Exploration

Includes all activities related to land and geophysical surveying for the purpose of determining locations for drilling and well development.

Plug and Abandon Well

Includes all activities related to plugging and abandoning a well after it reaches the end of its useful life. This includes removal of production equipment (e.g. separators, wellhead, tanks, pumping unit, vapor recovery and combustion equipment, etc.), removal and salvage of the casing, placing of cement plugs, and reclamation and remediation of the site.

Production

Includes all activities related to managing the well during production. This includes operation and maintenance of tanks and production equipment (separator or heater treater, vapor recovery equipment, flowlines, etc.), and monitoring, storage, and transportation of production and waste fluids. Excluded are well servicing activities (see [Well servicing, intervention, or workover](#)).

Site Preparation and Construction

Includes all wellsite activities related to the initial preparation of the wellsite. This includes leveling, access road construction, installation of boards, matting, or gravel, excavation or trenching of the reserve pit or cellar, and installation of wellsite water supply. Also included are activities related to drilling, setting, and cementing of the conductor hole (spudding in), rathole, or mousehole.

Unknown

Includes all activities where the operation cannot be determined from the available FOG data sources.

Unspecified: Off-Wellsite

Includes all activities that occur off the wellsite, excluding roadways, where the operation cannot be determined from available FOG data sources.

Unspecified: Roadway

Includes all activities that occur on a roadway where the operation cannot be determined from available FOG data sources.

Unspecified: Wellsite

Includes all wellsite activities where the operation cannot be determined from available FOG data sources.

Waste Fluids Treatment and Disposal

Includes all activities related to the treatment and disposal of oil and gas extraction waste fluids. On-wellsite and off-site treatment of waste, disposal of waste through an injection well, and off-wellsite storage of waste are examples of activities conducted during this operation. Excluded is the on-wellsite storage and transportation of waste.

Well completion: Flowback

Includes all activities related to flowback operations. This includes transportation, installation, operation, monitoring, maintenance, and dismantling of flowback equipment (separators, choke manifold, flow lines, tanks, etc.), well testing during the flowback stage, plug drill out, and monitoring, storage, and transportation of flowback fluids.

Well completion: Hydraulic Fracturing

Includes all activities related to hydraulic fracturing. This includes transportation, installation, operation, monitoring, maintenance, and dismantling of hydraulic fracturing equipment, perforating, fracturing fluid (base fluid, proppant and chemical additives) blending and pumping, and zone isolations. Excluded are activities related to flowback (see Well completion: Flowback) or other well completions activities (see Well Completion: Other).

Well Completion: Other

Includes activities and methods to prepare the well for production after it has been drilled. This includes Installation of production tubing and well surface equipment (wellhead, pumping unit, christmas tree, etc.), perforating, setting packers, and techniques to begin flow (well cleanout, pumping of high-pressure gas, acidization, etc.).

Well Servicing, Intervention, or Workover

Includes all activities performed on the well after it has been completed including maintenance, remedial treatments, alterations, repairs, assessment of well or reservoir performance, and well recompletion. This includes service and workover rig activities, snubbing, swabbing, well cleanout, repair or replacement of tubing, rods, casing, or other downhole equipment, secondary cementing, and maintenance of well surface equipment such as the wellhead, christmas tree, and pumping unit.

Yard Operations

Includes all activities that occur off wellsite at equipment yards, shops, etc. This includes equipment loading and unloading, off wellsite repair, maintenance, refurbishment, and cleaning of equipment, rigs, tanks, etc.

Worker level variables:

Event type

FOG event types describe how the fatal injury or illness occurred. In FOG, each fatally injured worker is assigned only one event type. In instances where two or more events occur to a single victim, precedence is given to the initial event type. For example, a worker that is struck by a piece of equipment resulting in a fall will be categorized as a struck by incident since this event caused the fall.

Definitions of each FOG event type are below.

Contact injuries

Caught between or crushed

Workers who were injured as a result of being squeezed, crushed, pinched, or compressed between two or more objects, between parts of an object, between other meshing objects, between a moving and stationary object, between two or more moving objects, in collapsing material, or in operating equipment.

Struck against

Workers who were injured as a result of making contact (bumping into, stepping on, being pushed, thrown into, or against objects, etc.) or impact with stationary objects or equipment.

Struck by

Workers who were injured as a result of making contact or impact with objects or equipment that were flying, discharged, dislodged, swinging, slipping, sliding, or rolling. Excluded are objects or equipment that fell from an elevation to a lower level.

Struck by falling object

Workers who were injured as a result of contact or impact with objects or equipment that fell from an elevation to a lower level. This includes instances where the injured person is crushed, pinned, or caught under a falling object.

Electrocutions

Workers who were injured from contact with electricity. This includes direct contact from the power source to the worker or indirect contact, such as when an object the worker is touching contacts a power source. Excluded is contact with lightning (see [Exposure: environmental](#)).

Explosion (combustion) or fire

Workers who were injured in an uncontrolled fire or an explosion that resulted from combustion. This includes instances when a worker was fatally injured in a fire that originated at an intentional heat source (e.g., flare stack), as well as, unintentional and intentionally set explosions (e.g. perforating). Excluded are explosions that were not accompanied by combustion (see Explosion (Pressure)).

Explosion (pressure)

Workers who were injured in an explosion that was an unexpected pressure release. FOG defines explosion as a rapid expansion, outbreak, bursting, or upheaval. Large and small explosions are included. Excluded are explosions that are accompanied by combustions (see Explosion (combustion) or fire).

Exposure

Alcohol or drug overdose

Workers who were poisoned due to unintentional alcohol or drug overdose. Excluded are instances where alcohol or drug use contributed to an incident but was not the cause of death or injury.

Cardiac event (possible work exposure)

Workers whose cause of death or diagnosis was determined to be a heart attack, heart arrhythmia, sudden cardiac death or other heart-related episode where symptoms of the cardiac event began at work and a specific workplace event, exposure, or practice is suspected to have contributed to the worker's death.

Environmental

Workers who were injured from contact with or exposure to a condition or substance that is a part of the environment. This includes drownings in reserve pits or manmade or natural bodies of water, contact with temperature extremes (e.g. heat stroke and hypothermia), contact with lightning, contact with wildlife including insect or animal bites and stings, and instances of extreme weather events. Excluded are oxygen deficient environments (see Exposure: harmful substance).

Harmful substance

Workers who were injured due to inhalation, absorption (skin contact), or ingestion (swallowing) of a caustic, noxious (harmful) or allergenic substance in confined or open spaces. Also included, are instances where the worker is exposed to oxygen deficient environments. Excluded are drownings and venomous bites and stings (see Exposure: environmental), and unintentional alcohol or drug overdose (see Exposure: alcohol or drug poisoning).

Hot or cold objects

Workers who were injured from contact with hot or cold objects or substances. Included is contact with heat sources such as welding torches or heated fluids; contact with fire and flames from stoves, furnaces, etc.; radiant heat emitted from such sources. Contact with cold objects includes contact with dry ice, liquid nitrogen, etc.

Undetermined (possible work exposure)

Workers who were injured while at work or sought medical attention for symptoms experienced at work where a specific workplace event, exposure, or practice is suspected to have contributed to the worker's injury or death, but the manner and cause of the worker's injury or death cannot be confirmed from available sources.

Fall

From height

Workers who were injured in a fall or jump to a lower level (point of contact with the source of the injury was lower than the surface supporting the worker before the fall). This includes instances where the worker fell from stairs, steps, ladders, or other places of height.

Same level (slip or trip)

Workers who were injured in a fall on the same level (point of contact with the source of the injury was on the same level or higher than the surface supporting the worker before the fall). This includes instances where the worker slip or trips.

Intentional acts

Workers whose death or injury was a result of suicide, homicide, or other actions taken by themselves or others that were intentionally meant to cause harm.

Overexertion

Workers who were injured as a result of excessive physical effort. This involves lifting, pulling, pushing, turning, carrying, etc.

Vehicle incident

Includes incidents involving vehicles (motor vehicles, powered industrial vehicles, powered mobile industrial equipment, trains, watercraft, and aircraft). Excluded are incidents where the worker was injured solely with the non-transport components of the vehicle, such as being struck by rising forklifts or swinging buckets on a loader or falls from vehicles while the vehicle is not in transport.

Vehicle incidents are coded into the four following categories:

On-site

Workers who were injured in incidents involving vehicles that occur at oil and gas extraction workplaces (e.g., oil and gas wellsites, yards, storage facilities).

Other location

Workers who were injured in incidents involving vehicles that did not occur on a roadway or an oil and gas extraction site. (e.g. air or water travel)

Roadway

Workers who were injured in incidents involving vehicles that occurred or originated on roadways including public highways and streets, lease roads, or other roads normally used for travel.

Unspecified location

Workers who were injured in incidents involving vehicles where the location of the incident is not apparent from available sources.

Events with no known work exposure

Cardiac event (no known work exposure)

Workers whose cause of death or diagnosis was determined to be from a heart attack, heart arrhythmia, sudden cardiac death, or other heart-related episode where symptoms of the cardiac event began at work and are not attributable to a specific workplace event, exposure, or practice.

Unknown

Workers who died or were injured and the event could not be determined.

Industry group

In FOG, the industry group is determined by the [North American Industry Classification System \(NAICS\)](#) code of the employer. A company's NAICS code is based on its primary business.

FOG includes worker fatalities related to U.S. oil and gas extraction ("upstream" sector of the oil and gas industry), which involves the exploration for crude oil or natural gas fields and the drilling and operating of wells that bring crude oil or natural gas to the surface (see [What's Collected](#) for more information). The oil and gas extraction industry is described by NAICS codes 211, 213111, and 213112 (see Oil and gas extraction industry groups below for full NAICS descriptions). However, employers from other industries (i.e. other NAICS codes) also often conduct oil and gas extraction work as contractors. Fatalities resulting from oil and gas extraction activities conducted by these contractors are also included in FOG. These industry groups predominantly include NAICS codes 2389, 4842, 5324, 54324 (see [Other industry groups that do work in oil and gas extraction](#) below for full NAICS descriptions). Each fatality in FOG is assigned to one industry group.

Oil and gas extraction industry groups ("upstream" sector)

Operating company (NAICS 211120 and NAICS 211130)

Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Drilling company (NAICS 213111)

This U.S. industry comprises establishments primarily engaged in drilling oil and gas wells for others on a contract or fee basis. This industry includes contractors that specialize in spudding in, drilling in, re-drilling, and directional drilling.

Servicing company (NAICS 213112)

This U.S. industry comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related construction activities). Services included are exploration (except geophysical surveying and mapping); excavating slush pits and cellars, well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells.

Examples of other industry groups that do work in upstream oil and gas extraction

Other specialty trade company (NAICS 2389)

This industry group comprises establishments primarily engaged in specialized trades (except foundation, structure, and building exterior contractors; building equipment contractors; building finishing contractors; and site preparation contractors). The specialty trade work performed includes new work, additions, alterations, maintenance, and repairs. In the oil and gas extraction industry, these companies are typically involved in the initial site preparation and other site construction activities for oil and gas wells.

Specialized freight company (NAICS 4842)

This industry group comprises establishments primarily engaged in providing local or long-distance specialized freight trucking. The establishments of this industry are primarily engaged in the transportation of freight which, because of size, weight, shape, or other inherent characteristics, requires specialized equipment, such as flatbeds, tankers, or refrigerated trailers. In the oil and gas extraction industry, these companies are typically involved in hauling fluids (crude oil, production water, etc.) to and from oil and gas wellsites.

Commercial and industrial machinery and equipment rental and leasing company (NAICS 5324)

This industry group comprises establishments primarily engaged in renting or leasing commercial-type and industrial-type machinery and equipment. Establishments included in this industry group are generally involved in providing capital or investment-type equipment that clients use in their business operations. These establishments typically cater to a business clientele and do not generally operate a retail-like or storefront facility.

Geophysical surveying and mapping company (NAICS 541360)

This industry comprises establishments primarily engaged in gathering, interpreting, and mapping geophysical data. Establishments in this industry often specialize in locating and measuring the extent of subsurface resources, such as oil, gas, and minerals, but they may also conduct surveys for engineering

purposes. Establishments in this industry use a variety of surveying techniques depending on the purpose of the survey, including magnetic surveys, gravity surveys, seismic surveys, or electrical and electromagnetic surveys.

Other Variables

Working alone

Worker was fatally injured without any other worker or person present at the worksite or in the vehicle.

Working on-site unobserved

Worker was fatally injured while working independently and unobserved by other workers on-site.

Years of industry experience

Number of known years of experience the worker has in the oil and gas extraction industry, as documented by [What's Collected](#).

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