Technical Topic

Safety in Lubrication

During the past decade, industry has taken greater notice to the tremendous personnel and monetary loss due to accidents and safety incidents in the work place. Investigations often revealed that the mishap would not have occurred if strict safety policies were in effect OR those involved would have simply abided by safety guidelines in effect. Personnel involved with plant lubrication often work alone and in very dangerous environments. Hence, it is of the utmost importance that those involved with plant lubrication be familiar with the many hazards associated with handling, storing, and using petroleum products.

High Pressure Injection Hazards

High-pressure injection injuries, also known as grease gun injuries, are caused by the accidental injection of a foreign material, such as grease, oil, or solvent under pressure, through the skin and into the underlying tissue. This is analogous to medical techniques used to administer immunization shots without a needle. A grease gun injury can cause serious delayed soft tissue damage and should be treated as a surgical emergency. Any person sustaining an injury of this sort should seek immediate medical attention regardless of the appearance of the wound or its size. Accidents involving injection injuries can occur when using any type of pressurized equipment. Two common cases in which petroleum products may be involved are accidents with pressurized grease guns or with hydraulic systems.

Pressurized grease guns are commonly used in service stations, garages, and industrial plants. Typically, most service stations have grease guns operating at 621–1034 kPa (90-150 psi) air pressure. Most modern industrial hydraulic systems operate in the range of 13,790 to 34,475 kPa (2000 to 5000 psi). A stream of oil ejected from a nozzle or leak under pressure of this magnitude has a velocity comparable to the muzzle velocity of a rifle bullet.

The most common sites of injury are the fingers or the hand. However, any part of the body can be involved. With grease guns especially, accidents usually occur then the injured person wipes the tip of the nozzle with his finger or the nozzle slips off the grease fitting while being held in place. Grease may also be injected into the body from a leak in the grease line. In hydraulic system accidents, a leak in a hydraulic line can emit a high-velocity stream of oil and cause injury if it strikes a person. Workers are commonly injured if they try to stop the leak by covering it with their hand or finger. Solvent injuries have been reported from paint spraying operations.

Chemical irritation is not a major problem with most petroleum products because hydraulic oils and greases are generally non-irritating and non-toxic to tissue. However, the resulting bacterial infection can be

a problem because of the damaged tissue and circulation in the wound, even though it has been surgically opened and the foreign material removed. One of the greatest dangers of this type of injury is that it is not recognized quickly by the injured person as being serious. Often the initial wound may be very small and essentially painless. The injured person may even continue working. However, in every case where a person receives this type of injury, he should stop work and get **immediate** medical treatment.

The following are some of the basic rules that should be strictly observed.

DON'T

- Play around with or use a grease gun for practical jokes.
- Touch the end of a grease gun.
- Use any part of the body to test a grease gun for grease flow.
- Use any part of the body to stop a leak in a hydraulic line.

DO

- Routinely check all hoses for wear and possible weak spots.
- Handle a grease gun with respect for its power.
- Take special care when starting up a new hydraulic system to be sure that every part of the system can withstand the operating pressure.

IN CASE OF A GREASE GUN ACCIDENT, SEEK IMMEDIATE MEDICAL TREATMENT. Identify the grease or oil involved in the accident by brand. Contact the supplier or the manufacturer for additional information about possible toxicity if more information is needed by a physician or hospital.

Mechanical Hazards

Handling Drums: A full 55-gallon drum of oil or grease weighs about 450 pounds (204 kg). Never drop a drum as it may bounce out of control or burst at a seam, creating a spill and/or fire hazard. Two people should overturn or upend a drum to prevent muscle strains and other injuries. When rolling a drum, always keep it's motion in check — never allow to free roll. When hoisting a drum, use a drum sling that will hook over the ends of the drum. Do not use air pressure to empty a drum as it may burst open.

Oil and Grease Spills: Oil or grease spilled on floors, catwalks and ladders can cause serious falls and fire hazards. Wipe up lubricant spills immediately or use absorbent drying pads or granules. Repair or report sources of lubricant leaks. In the oil house or storage area, replace leaky dispensing devices, keep drip pails in place, and wipe up any spills.

Application to Machines: Do not apply lubricants to machines in operation unless the machine is equipped with central lubrication systems or the fittings and oil caps are piped out to a safe place. Do not reach over, under, through or past moving parts of machinery. For machinery requiring lubrication during operation, refer to OEM recommendations for safety procedures. For machinery that specifically require shutdown for lubrication, ensure the machinery is properly locked or tagged out of service.

Machine Guards: Guards on belt or chain drives, open gears, couplings etc., should be removed only after the machine is shutdown. Replace guards promptly after lubrication work is done and report broken or damaged guards or places where guards are needed.

Ladders and Work Lifts: A ladder should be of suitable material; for example, a metal ladder or lift should not be used where there is a possible contact with electrical wiring or equipment. Use ladders of the proper length — do not overextend extension ladders. A ladder or lift should be inspected to be sure that the safety feet, rungs and slide rails are in good condition and free of oil and grease. Use both hands when climbing; carry equipment in a sling, bag or pockets, or hoist it up to the point of use.

Safe Clothing: Follow plant rules for the proper kind of safety shoes, hats, goggles, glasses, gloves, or special clothing. Do not wear loose or torn clothing that can be caught in moving parts of a machine and wear long sleeves in the vicinity of hot surfaces.

Hand Tools: Take special care when using hand tools. Use the right tool for the job; do not improvise or change its configuration for a purpose that it was not intended. High pressure grease guns can develop several thousand pounds of pressure and a grease jet from a grease gun can pierce the skin.

Hazards to the Skin: The skin may be sensitive to prolonged exposure to petroleum products such as cutting fluids, solvents and rust preventatives. Irritation, itching, or skin rashes (dermatitis) may develop. To prevent trouble or escalation, wear rubber gloves whenever possible. Wash hands and effected skin areas frequently with mild soap and warm water. Launder oil-soaked clothes and get first aid for cuts and scratches exposed to petroleum products.

Fire Hazards

Most petroleum products will burn. Lube oils and greases have relatively high flash points, but solvents, kerosene, diesel fuel and gasoline have much lower flash points and will burn readily. DO NOT use gasoline for cleaning and DO NOT smoke around any petroleum product.

In Case of Fire: In the event of a fire, sound the alarm, get help, dial 911 (or your plant's emergency line), THEN attempt to fight the fire. Know where fire extinguishers are located and how to use them. Do not let the fire cut off your escape route. Stay upwind and do not breathe any more smoke than is necessary as smoke from certain petroleum fires can be toxic. Whenever possible, use dry chemical, foam or CO2 extinguishing agents. Water can be used, but be cautious of using solid streams as they tend to disperse the effected area and will conduct electricity if sprayed directly on a live electrical panel.

Oily Rags: Keep oily rags in a labeled, closed, oily waste can. Rags soaked with paint or linseed oil should not be kept in a closed container, but instead be hung up to dry and then disposed of according to plant and municipal regulations.

Handling Solvents: Many solvents emit enough vapor to form flammable mixtures with air. Any spark, even from static electricity, can cause a fire. Before opening or dispensing solvents or fuels, make sure the containers are grounded, either with ground wires, metal to metal contact between containers or direct contact with the ground. Handle solvents in well ventilated areas and keep containers closed when not in use.

Hazards to Lungs

Toxic vapors, mists, or dusts can form in plant working areas and prolonged exposure can be hazardous. If overexposed, get out of the area and get first aid. Know the products you are working with — ExxonMobil publishes an MSDB (Material safety Data Bulletin) for each product.

Do not enter any large confined spaces such as empty tanks, vats, kettles, etc., alone and without checking for oxygen deficiency with approved measuring devices. Regardless of toxicity levels, approved respiratory devices are recommended for use in these areas. Always use the "two-man rule" when working in these spaces and talk to each other frequently. Wear approved ropes/harnesses especially in unlit or dark areas.

Consult your local and state officials for published Lower Explosive Limits (LEL) and Permissible Exposure Limits (PEL).

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