

PETROLEUM DRILLING FLUIDS SECTOR

MINIMUM SAFETY, TRAINING AND SERVICE

GUIDELINES

PRODUCED BY

DRILLING FLUIDS COMMITTEE

PETROLEUM SERVICES ASSOCIATION OF CANADA

INTRODUCTION

The Drilling Fluids Sectoral Committee of the Petroleum Services Association of Canada (PSAC), following the lead of the petroleum industry's safety activity efforts through the Upstream Petroleum Industry Task Force on Safety (UPITFOS), has developed the series of guidelines in this booklet.

The guidelines address three areas and are intended to be used in conjunction with occupational health and safety and workers' compensation regulations, various provincial recommended practices, individual company safety and training standards, and other applicable regulations. In addition, an outline of typical field service levels to be expected from drilling fluid companies is included.

The PSAC Drilling Fluids Committee encourages non-member companies to join the Association and participate in the established standards. PSAC has developed a "Silver Seal" program which identifies Association members and a set of business standards which they have committed to abide by:

SECTION I

Minimum Safety Guidelines

A) Safety Supervisor

All companies must appoint a safety supervisor who is responsible for the following:

1. Ensure compliance with government and company safety requirements.
2. Audit and enforce vehicle, wellsite, and warehouse safety on an ongoing basis.
3. Provide or arrange training programs on government and company safety policies.
4. Provide adequate safety equipment.

B) Driver/Vehicle Safety

1. All company personnel must comply with local government licensing requirements.
2. Drivers and passengers in company vehicles must wear seat belts.
3. No alcohol or drugs are to be consumed or otherwise taken prior to or while operating a company vehicle.
4. The driver of the assigned company vehicle must report any abnormalities to the drilling fluid company Safety Supervisor.
5. All vehicles must meet appropriate government safety standards.
6. All vehicles must contain a valid fire extinguisher and flares.
7. Survival equipment must be carried in vehicles when applicable (e.g. sleeping bags, winter clothing, first aid kit).
8. Headlights should be used at all times while driving.
9. Daily checks of oil, tires, lights, and emergency equipment must be done.
10. Windshields must be replaced when vision is restricted.
11. All objects being transported inside the vehicle (e.g. mud testing equipment) must be securely fastened so as not to endanger the driver and passengers in the event of an accident or sudden braking.

C) Worksite Safety

1. Employees must wear appropriate workwear including an approved hard hat and steel toed boots at all times.
2. Employees must wear appropriate fire retardant work wear when requested by the Drilling Supervisor or when fire hazardous situations exist. This clothing must be carried in the vehicles and be available at the worksite at all times.

3. It is the responsibility of each employee to make himself aware and comply with wellsite safety regulations, particularly in the case of critical wells or situations including:
 - Emergency plans.
 - Evacuation procedures.
 - Escape routes.
 - Location of fire fighting equipment, breathing apparatus, and first aid equipment.
4. Employees must not at any time operate any rig equipment (i.e. mixing equipment, valves, or choke manifold).
5. Employees must hold valid H₂S Alive certification and be trained in WHMIS and TDG where appropriate.

D) Warehouse Safety

1. Appropriate workwear including: hard hat, coveralls, and steel-toed boots must be worn at all times.
2. All necessary protective equipment will be made available (e.g. eye, ear, and face protection) and worn by the employees when required.
3. Employees must be trained to operate any warehouse equipment (e.g. forklift) which they may operate.
4. All equipment must be inspected and maintained on an ongoing basis as per company specifications.
5. Good housekeeping practices must be maintained.
6. MSDS documentation must be posted in visible locations.
7. Appropriate emergency numbers must be posted near all telephones.
8. All spillage of products must be disposed of according to government regulations.
9. All exits from the warehouse must be properly signed and must be kept clear of all obstructions.
10. Valid fire extinguishers must be available in convenient locations which are properly signed.
11. All warehouses must be structurally safe with adequate lighting and ventilation.

E) Safety Meetings

1. Safety Meetings must be held and documented on an ongoing and regular basis to ensure that all personnel understand the requirements and potential hazards of the job, that the required safety equipment is available, and that personnel know how to use the appropriate safety equipment properly.

SECTION II

Minimum Safety Guidelines

A) Training Criteria

In an effort to provide training standards, the PSAC Drilling Fluids Sectoral Committee has developed guidelines for the basic or minimum level of training a drilling fluid company field representative should have.

1. Comprehensive Drilling Fluid School
 - Course Outline -
 - a. Drilling fluid - its functions, types, and additives
 - An overview of drilling fluid functions
 - Drilling fluid systems
 - Additives and the treatment of water based muds
 - Special fluid systems
 - b. Drilling fluid rheology
 - c. The composition and rheology of drilling fluids
 - d. Drilling fluid flow in pipes and annuli, bit hydraulics
 - e. Drilling fluid carrying capacity
 - f. Special drilling and drilling fluid problems.
2. H₂S Training (Private or PITS)
 - a. H₂S Alive Certification standard
3. WHMIS and Transportation of Dangerous Goods Training
 - a. Emphasis on responsibilities and products used in drilling fluids sector
4. Non-Operational B.O.P. Course
 - a. Detection
 - b. Calculations to kill well

- c. Killing a well
 - Drillers Method
 - Wait and Weight Method
 - Circulate and Weight Method
 - 5. Off Road Driving Course
 - a. For new people introduced to industry
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SECTION III

Minimum Service Guidelines

A) Service Levels

The drilling fluid company representative will provide the following services when applicable:

1. Service:
 - Spud report
 - Drill out reports
 - Water drilling - every second day
 - Mud up report
 - Daily checks to total depth while "on mud"
 - After logging, mud technician is on a "call out" basis for any abnormal problems; bridges, sloughing, kicks, etc.
 - Timing of service at the discretion of the drilling fluids representative unless abnormal drilling problems occur (e.g. lost circulation, hole sloughing, blowouts, and contaminants)
2. Chargeable checks:
 - Trip for inventory control or counts
 - Call cuts for drill stem test fluid recovery
 - Pre-production casing cementation drilling fluid analysis
 - Solids equipment evaluation and fluid analysis

B) On Location Duties

The drilling fluid company representative will have the following duties at a wellsite location when applicable:

1. Drilling fluid analyses (where applicable):
 - Fluid temperature
 - Density
 - Viscosity
 - Hydraulics (annular velocity, bottoms up, circulation time, etc.)
 - Rheological properties
 - Filtration characteristics
 - pH
 - Solids content
 - Water content
 - Oil content
 - Alkalinity
 - Calcium
 - Potassium
 - Chlorides
 - MBT
 - Garrett Gas Train (known H₂S areas)
 - HT - HP (invert muds and deep hot holes; i.e. above 250⁰ bottom hole)
2. Inventory - To assure adequate amounts of materials are on location as per drilling fluid program.
3. To make recommendations and provide technical assistance of the drilling fluids systems as per the drilling fluid program.

C) Abnormal Situations

1. Blowouts and Kicks

The drilling fluid company representative will help, if requested, to calculate pressures and volumes required to overcome

problems. Final decisions on mud density and volume are the responsibility of the operator.

2. In cases of loss of circulation, the drilling fluid company representative will recommend procedures and mixing ratios to regain circulation as quickly as possible. All procedures should be approved by the operator prior to implementation.

D) Restrictions

Drilling fluid company representatives are not responsible for the following, due to various government regulations and liabilities:

1. The operation of contractor equipment or the mixing of drilling fluid products (Workers' Compensation legislation).
 2. The operation, repair, or maintenance of solids control equipment.
 3. Installing or removing corrosion rings or coupons.
 4. For delivering newspapers, rig parts, drilling fluid products, or any other items which should be utilizing hot shot units, or others means of delivery.
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