references:


Causes for Fishing Operations

**Fishing** is any operation or procedure to release, remove or recover tubulars or other material in the hole that adversely affects drilling casing or completing operations.

Categories requiring a Fishing Job

- **Drillstring stuck**
  - Formation related
  - Drilling Operation related
- **Failures of Equipment**
  - Roller Cones
  - Drillpipe rupture
  - Packers
- **Objects lost**
  - Logging Sondes
  - Packer Elements
  - Tools fallen into hole
Causes of Stuck Drill String

It is estimated that drilling industry spends $200 to $500 millions annually due to stuck drill string related hole problems

(1) Formation related Causes
(2) Drilling Operation related Causes
1. Formation Related Causes of Stuck Drill String

- Mobile Formations (salt, plastic shale)
- Unconsolidated Formations (sands, gravels)
- Fractured / Faulted Formations (fault/rubble zones)
- Reactive Formations (swelling clays)
2. Drilling Operation Related Causes of Stuck Drill String

- Junk in Hole (lost roller cone)
- Poor Hole Cleaning
- Keyseat in Doglegs
- Collapsed Casing
2. Drilling Operation Related Causes of Stuck Drill String

- Differential Sticking
  - Mud Cake
  - Too Thick

- Undergauge Hole
  - Worn Bit Gauge

- Cement Related
  - Flash Setting
  - of Cement
Principle of Jarring Operation

- **Bumper sub is opened**
- **Stuck pipe is pulled and elongated**
- **Stuck pipe drops by Δl and is stopped with the brake**
- **Upward blow by elasticity**

Diagram:
- **Rotary table**
- **Drop of Δl**
- **Δl**
- **Blow**

Steps:
1. Bumper sub is opened.
2. Stuck pipe is pulled and elongated.
3. Stuck pipe drops by Δl and is stopped with the brake.
4. Upward blow by elasticity.
OPTIONS FOR HANDLING A FISH

GRIP ON CYLINDRICAL OR TUBULAR FISH

ABANDON THE FISH

PUSH INTO WALL OF HOLE

DRILL UP FISH AND REMOVE AS CHIPS

DEFLECT HOLE FAST THE FISH

DRILL THROUGH THE FISH (DIAMOND DRILL)

ABANDON HOLE

USE FISHING TOOL WHICH...

GRIPS THE I.D.

GRIPS THE O.D.

CANNOT CIRCULATE THROUGH FISH

ALLOWS CIRCULATION THROUGH FISH

LOCKS ON TO FISH

WILL RELEASE FROM FISH WHEN DESIRED

OTHER

WIRE ROPE (CABLE)

LARGE FISH

SMALL FISH

MAGNETIC FISH

NON-MAGNETIC FISH

PICK UP FISH OF MISCELLANEOUS SHAPES
Techniques for Catching the Fish

- Screw in
- Swallowing the fish
- Outside catch
- Inside catch

(a) Conventional screw-in connection
(b) Spear inside of washover pipe
(c) Junk inside of a junk basket
(d) Outside pipe cutter, junk riding on blades
(e) Conventional overshot
(f) Die collar
(g) Casing spear
(h) Taper tap
(i) Inside pipe cutter, junk riding on blades
Overshot is the most important and widely used fishing tool.
Recovering or Removing Small Junk

(a) Small junk such as bit cones in the hole
(b) Mill up
(c) Drill up
(d) Wall off

(e) Recover in a junk basket
(f) Recover with a magnet run on pipe
Various Types of Milling Tools

- Pilot Mill
- Taper Mills
- String Taper Mill
Working Principle of a Junk Sub

- drill collar
- area of reduced flow rate
- accumulated junk in basket
- junk sub

Junk sub used for cutting sampling in KTB ultradepth hole
Catching Roller Cones with Junk Basket

- going in the hole to recover junk (three bit cones)
- drilling over junk
- pulling out of the hole with the junk inside the junk basket note the curled teeth

- relief bushing
- barrel
- thrust bearing
- shoe
- pin & spring
- flipper dog
cage
Catching Logging Cable with a Wire-Line Spear

- drillpipe or tubing spear
- wire-line or rod spear

**Diagram:**
- Barbs
- Prong
- Bottom view

**Labels:**
- 180° phasing
- 120° phasing

**Section:**
- Cement
- Casing
- Wire line
- Rope socket
- Sinker bars
- Casing shoe
- Balled wire line
- Wire-line spear
Fishing Tools
Fishing Tools
Fishing Tools
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