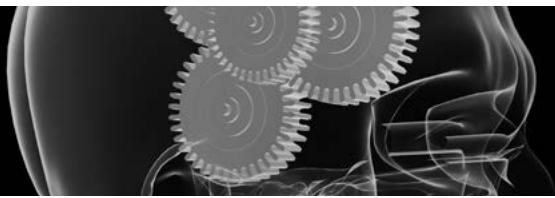


# HUMAN FACTORS

## How to take the next steps



### CASE STUDY 1 - People will put up with what they're given...

#### What happened?

A driller was operating a top drive drilling unit. There was a stand of drill pipe clamped in the slips, and the top drive was raised and held on the brake. The driller saw a roughneck step into a hazardous area of the rig floor, and reached for the microphone to tell the roughneck to step back. As he did so he slightly released pressure on the brake. The top drive descended, bending the drill pipe which fortunately did not spring out. A 27kg pipe-guide fell 90 feet to the floor, narrowly avoiding the roughneck.

Investigation found that at the time the incident occurred, the driller had all four limbs utilised. To stop personnel from entering the drill floor, the driller had to lean towards the microphone, use his left knee to operate the talk-back system, use his right foot on the manual brake, whilst still trying to maintain control of the top-drive using the hydraulic brake. The brake did have a "dead-man" position that applied the brakes if the handle was released. However, simply easing off hand-pressure actually removed the brake. This was a counter-intuitive design. The system was known to be difficult to operate.



#### What human factors were involved?

##### What did people do intentionally?

People accepted the poor layout and controls, and got on with the job. As different items of equipment were added, controls were placed wherever they could be, without considering how they would have to be used together. Many different people knew about the problems in the dog-house, but a "can do" attitude meant that people just put up with poorly designed equipment and controls.

##### What did people do without meaning to?

The driller released hand-pressure on the brake control. If the brake-control had been entirely released the brake would have applied automatically. Unfortunately, a small release in hand-pressure was enough to remove the brake.

Keeping your arm steady during a task requires concentration and balance. Changing your position affects this fine-control. The movement towards the microphone reduced pressure on the brake and the top drive descended.

#### Barriers



- Human Factors in Design



- Risk Assessment



- Managing Human Failures

#### What can we learn from this incident?

- Older equipment has sometimes been subject to incremental change, without any thought to how changes will interact. Apply a good quality management of change process to each change, to identify these interactions before they become a problem.
- Our ability to carry out physical fine-control tasks is influenced by our body position and balance, and requires concentration. An ergonomist can advise on what people will be physically capable of in different situations.
- People will put up with poorly designed equipment and make the best of it. Designers can't foresee all situations. Speak up if there is equipment which is difficult to operate.
- Get experienced end-users involved in the design and commissioning of equipment.