



## PRIMARY & SECONDARY DRILLER'S SPACE

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### Common Operational Problem

Many driller's cabins are in-efficient workplaces, having been originally laid out by engineers with little operation experience. With time the cabin can become cluttered, awkward to work in and difficult to see a clear view of the drill floor.

### The Solution - Primary & Secondary Driller's Space Concept

EFC's concept recognises that the following must be key elements of an upgrade or new Driller's Cabin / Console:

- Efficient workplace
- Based on ergonomic principles
- Uncluttered
- Future functional expansion requirements taken into account
- Primary space is limited, this should be utilised economically, allowing the driller to:
  - View the Rotary Table
  - View Key Displays
  - Reach Key Controls
  - Importantly, the Driller must be able to achieve these with minimum head and hand movement, without leaving the drilling position. This concept applies whether the driller is seated or standing.

### Primary Driller's Space

The primary driller's space lies in front and to both sides of the drilling position. This space is best occupied by panels angled to face a standing driller without parralax:

- Panel 1, low facing up
- Panel 2, above, slanting down

A narrow cabin is advantageous to a standind driller as controls on each side can be readily reached without walking. However, on a modern drilling rig consideration has to be given to accomodating an increasing quantity of controls and displays, as well as cabin visitors i.e., company representatives, toolpusher, fishing engineer etc. This can occur satisfactorily in a larger, more spacious cabin.

To improve operational efficiency it's vital that a driller in a larger, wider cabin doesn't suffer inconvenience during daily operations as a result of unplanned placing of controls and displays. This can be avoided by the construction of a 'driller's bay' area, giving the benefits of a narrow cabin.

A dedicated display facility can be considered for cabin visitors, consisting of screens for drilling data and TV signals located at an unobtrusive located



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### Secondary Driller's Space

Extending in all directions from Primary Driller's space lies Secondary Driller's Space. This is occupied by controls and displays which are required on a less frequent basis. These controls may be used to set-up equipment, rather than drive or control the equipment i.e. pump liner size selection, certain top-drive and pipehandler controls.

### 3) Seated Driller

The concept applies equally to a seated driller, although the distribution of Primary and Secondary panel space differs from that listed in paragraph 1 above. For a seated driller, the chair-side controls remove many of the front console controls, while the lower driller's position reduces the overall height of the console and risks spreading the instrumentation more widely than in a conventional console for a standing driller.

### 4) To Implement the Concept

- a. To utilise this concept of Primary/Secondary Driller's Space it is necessary to implement initial detailed planning and design. At the outset this consists of considering the views of drill cabin users and equipment operatives (driller and toolpusher) as well as those of rig management.
- b. Drilling technology develops all the time and current equipment operatives (the drillers) use equipment which, in some cases, has been developed only in the past few years, for example, Top-drives and Soft-Torque, which are operated by the current generation of drillers, but probably were not operated by their rig manager.
- c. Conversely, the rig managers and technology management group within a drilling contractor company are probably aware of potential functional changes which are being requested or considered by their clients, or which are being developed in-house.

This means that to optimise ergonomic cabin design it is necessary to consider the views of both operatives and management. In a well-designed driller's cabin, allowance must be made for the expansion of controls and displays induced by the inevitable functional changes which take place.



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### 5) Expandability

- a. Ideally, a driller's cabin must be able to accommodate future functional expansion without becoming cluttered, difficult to work in and difficult to see out of, which is the current situation on almost all drilling rigs. Technology is continuously developing in the field of displays and controls, and, if properly applied, such developments allow additional displays and controls to be incorporated into the cabin without damaging cabin ergonomics and visibility.
- b. Examples of such technology development are the use of screens which allow additional displays and screen pages to be built up as required: there are often specific requirements for High Pressure-High Temperature drilling and Kick Detection, for example. Screens are also ideal as alarm annunciators, the current generation of which are bulky with limited capacity for expansion.

Taken further, screens and data processors can be used to accommodate additional controls; this is currently seen as radical within the drilling industry, and proper console planning can free-up considerable primary console space without taking this particular step. However, taking advantage of such technology developments for certain selected controls can contribute to making the use of drill cabins more efficient.

### Examples

Examples of drilling controls which are candidates for size reduction include the drillfloor **BOP controls** (normally either direct pneumatic control, or electric control, mounted on a large EExd box) and the **driller's purged electric panel** for pumps, drawworks and rotary table. The BOP control panel is too large for inclusion within the cabin itself, although functionally there is logic in locating it close to the driller's position, while the purged electric panel can occupy 1 cubic metre or more of cabin volume directly to the left of the brake handle.

Shrinking both these panels would allow them to be located within the cabin, perhaps both of them occupying the volume currently occupied only by the electric panel.

- c. Screen technology has itself developed to the point where there are now available 14", 16" (and larger) TFT flat screens, which have the considerable advantage of requiring only a shallow protective or purged enclosure. An equivalent screen size provided by CRT technology would require a box almost 1 metre deep.

This means that the flat screens can be located in relatively shallow consoles, and so in a more optimum position than the older, bulkier CRT screens would allow: these flat screens can now occupy Primary Drilling Space.

- d. Flat screens can also be adapted to receive video signals from rig cameras and signals of the correct format (eg. RS232) from 3rd party sources, such as MWD or Mud-Loggers; this can reduce the requirement to accommodate additional, temporary displays and screens during drilling.

# Electro-Flow Controls



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- e. Creating additional space and volume within the drilling cabin can also be achieved by recognising that the cabin is the most valuable, expensive operator area on the rig and as such it should contain only man-machine interfaces and not equipment such as junction boxes and EExd marshalling boxes which, on many rigs, occupy a considerable area of this valuable space. These 'non-essential' items are far better located in a dedicated, rigfloor, safe area house (probably pressurised), where the electrician can have unimpeded access and where the components can be uncertified.

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### Conclusion

Applying the principle of Primary and Secondary Driller's Space to cabin upgrades, either wholesale or partial, can have a very considerable impact on the functionality and appearance of the cabin. Properly applied, it can ensure that for several years following the upgrade there is no requirement to add display or control boxes and that the daily drilling operations remain as straightforward as possible.

The cabin is also very significant from the operator's viewpoint, particularly at the time when he is visiting the rig to make a hiring assessment. It is one of the key areas from where the rig is judged, and having a well organised, uncluttered cabin, when so many competitors do not, can only be beneficial to the rig owner.

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