

Drill-In-Casing System

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Scientific Application

The Drill-In-Casing (DIC) system drills in a short 10¾ in. casing string simultaneously with the bit to support an unstable sediment zone, thus preventing premature loss of the hole or loss of a drill string because of hole collapse, allowing continued coring to meet the scientific objectives at the hole. The DIC is always available as a tool of last resort to achieve penetration in unstable sediments. The purpose of this tool is similar to the Hard Rock Reentry System (HRRS), except the HRRS is designed to be used in unstable hard rock formations.

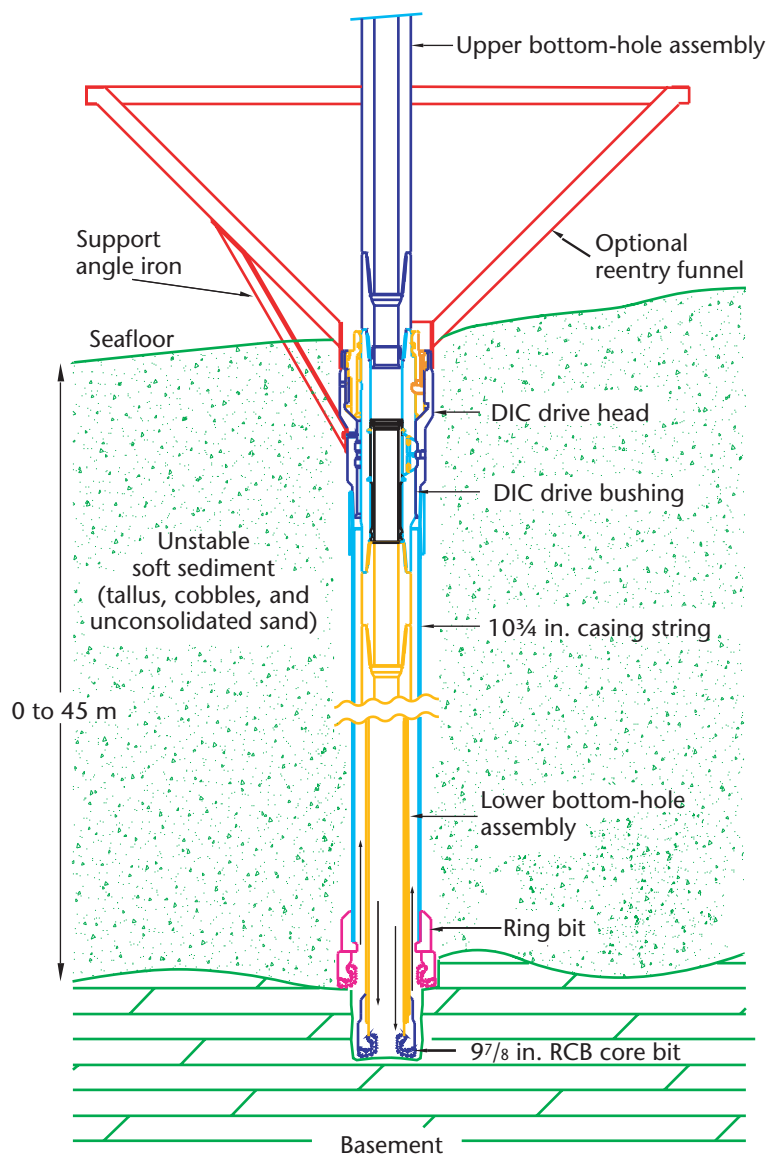
Tool Operations

The DIC system allows the casing string and a casing ring bit to be drilled in as a unit. The system utilizes a DIC drive head and bushing that enables the drilling torque to be transmitted to both the casing string and bottom-hole assembly (BHA). Once the DIC is drilled into place, the casing string is released from the BHA. The DIC is run in one of two modes: with or without a funnel. When used without a funnel, coring continues directly after the casing is installed. This is not recommended because the drive head restricts circulation in the annulus. When used with a funnel, the drive bushing can be retrieved and a bit tripped back in the hole to continue coring.

Design Features

1) Isolate Unstable Zones

The DIC can support unconsolidated sediments or unstable zones below the seafloor.



Schematic of the Drill-In-Casing (DIC) system installed in shallow and unstable sediments. The optional reentry funnel is free-fall deployed. The 9⅞ in. rotary core barrel BHA and bit can be released to core ahead without making a trip. Soft formations typically seal the annulus, thereby directing drilling fluid returns through the casing.

Benefit: Unstable upper zones and fault zones can be isolated by drill-in casing allowing deeper coring and/or logging.

2) Reentry

An optional reentry funnel can be added in the moon-pool before running the tool.

Benefit: A DIC borehole can be reentered to continue drilling below an unstable or flowing zone.

3) Casing Ring Bit

A ring bit is welded to the bottom of the 10³/₄ in. casing and left in place with the casing.

Benefit: Permits drill-in capability of the casing.



Drill-In-Casing system running tool.

Considerations

Coring operations cannot occur while the DIC is being drilled into place

Typical DIC depth range is determined by the position of formation instability and casing hole drag, but is generally limited to a depth of 40 to 120 mbsf.

The DIC is designed for drilling-in casing into unstable soft sediment to achieve deeper scientific objectives in a single hole

Deployment of the DIC with the optional reentry funnel does not replace the multiple casing string capability of a standard full-size reentry cone installation on deep holes

The DIC is not robust enough to drill into consolidated formations, hard rock, or basement

Additional casing strings cannot be deployed with the DIC