



# Safety Alert

From the International Association of Drilling Contractors

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ALERT 99-31

## HIGH PRESSURE RELEASE OF TRAPPED NITROGEN

### WHAT HAPPENED:

Following the foam cementation of 20" (50 cm) casing in deepwater from a semi-submersible rig, the inner cementing string was found to be plugged during its recovery. When breaking out the final joints of cement stinger using chain tongs, a high-pressure release of trapped nitrogen gas blew cement particles into the face of a floorman.

### WHAT CAUSED IT:

1. The casing inner string cement job was underdisplaced, leaving a cement wiper ball and a quantity of cement inside the stinger. The cement set, trapping a pressurized nitrogen between the wiper ball and the cement. When breaking out the drillstring, this pressure was released at the drillfloor. The source of the trapped nitrogen was later identified as leaking valves in the cementing head assembly, which allowed nitrogen to enter the ball launch sub during earlier foam cementing or line testing operations. This nitrogen was subsequently pumped downhole ahead of the cement wiper ball.
2. Normally, the cement stinger would have been circulated clear prior to pulling out of the hole. On this occasion significant operational problems substantially delayed the recovery of the inner string. This allowed the cement to set, creating a pressure seal.
3. The deepwater required the use of an extended length of inner string and foam cement, a contributing factor to the incident.

### CORRECTIVE ACTIONS:

1. The design of the ball launch assembly used in this application should be reviewed to consider the use and type of full opening safety valves and the addition of a pressure venting port to the cementing head valve and ball launch assembly.
2. Personnel should be made aware of the hazards associated with pumping drill-pipe wiper balls following cement displacement (up to 1500 psi may be required to get the ball moving once it has stopped). Consult the operator and appropriate third party personnel as to design and potential hazards associated with this operation. This information should be reflected in the Job Safety Analysis (JSA) for this operation. More information on JSAs can be found in the *IADC Accident Prevention Reference Guide*.
3. Cementing calculations and job execution should be independently verified.
4. If a plugged stinger or similar toolstring is recovered from the wellbore, consideration should be given to the possibility of trapped pressure. Appropriate procedures should be employed to break the string out, including use of the iron roughneck and the use of adequate PPE.

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**The Corrective Actions stated in this alert are one company's attempts to address the incident, and do not necessarily reflect the position of IADC or the IADC HSE Committee.**

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