

SAFETY ALERT

Recent incident relating to the use of a mobile ground investigation drilling rig

Consequences:	Serious head injuries, delay to works.
Incident Potential	High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/>
Incident Description	 <p><u>Activity</u></p> <p>Geotechnical drilling operations using a mobile drilling rig, geobore S drill string and 200mm casing.</p> <p><u>Background</u></p> <p>In order to progress the geobore S coring it was necessary to lower the height of the top of the 200mm casing below the drilling table by using the rotary head to 'drill-in' the casing. To do this the geobore S casing had to be removed from inside of the 200mm casing requiring splitting of the joint at the drill head rod to the geobore S drive head.</p> <p>To enable the casing to be reset to the correct height above the ground using the rotary drill head it was necessary to break out the geobor S drill string thus enabling the 200mm casing drive head to be attached to the 200mm casing. During this process the geobor S drill string unscrewed inside the casing. The top section of the geobor S drill casing was withdrawn from the 200mm casing and moved to the side of the drill rig using the drill head carriage.</p> <p>To break the drill string at the required joint, a stillson wrench was attached to the geobor S drive head and braced against the drill rig mast with approximately a 70mm overlap. Having positioned the wrench, the assistant driller was in the process of leaving the area and closing the interlocking gate when the rotation lever on the control panel was accidentally activated by the lead driller when he tripped and fell against it. This action caused the drill string and wrench to rotate hitting the employee in the head.</p>
Injuries / Medical treatment required:	Multiple fractures to the head. Critical injury hospital treatment.

Findings:	<p>The following contributing factors have been identified:</p> <p>The ground was rough (ploughed field) and whilst walk ways had been established and boards laid, the conditions underfoot were less than ideal.</p> <p>200mm casing lengths taken to the drill site were 1.5m long, two of which had been installed. The 200mm casing when installed was unable to be advanced passed the drill table.</p> <p>Attaching the stillson wrench to the geobor S drive head with the rotary head off centre is an insecure method of break out when the stillson wrench is braced against the drill rig mast with the intention of breaking the geobor S drill string by rotating the rotary drill head.</p> <p>Activation of the control lever caused the drill string to rotate which in turn caused the unrestrained geobor S casing to “kick out” allowing the wrench to slip off the drill mast.</p> <p>During the incident investigation it was found that the drill rig and interlocking guard operated as designed however, it has been established that the automatic “slow rotation” feature (guard open) allows one rotation of the rotary head at 51rpm before slowing down to 7rpm</p> <p>Note. The current European Standard EN16228-1:2014 states reduced rotation speed range should be 30 rpm to 0 rpm.</p>
Lessons Learnt:	<p>The following lessons have been learned:</p> <p>Greater attention should be paid to the ground conditions thus, ensuring that the potential for a slip, trip or fall is reduced to a minimum.</p> <p>There needs to be a better understanding of what to do when “change” occurs and how to ensure that the risk is properly managed e.g. by following industry best practice and company guidelines.</p> <p>Breaking out a drill pipe using the methodology as applied in this case is bad practice.</p> <p>A drill string should not be broken out without being connected at the top and retained at the bottom by the breakout clamp or inside the borehole and/or casing.</p> <p>Reliance should not be placed on the manufactures equipment settings and should be checked for accuracy before the equipment is taken into use for the first time. Equipment settings should then be checked according to the manufacturers equipment inspection and service schedule or after any potential failure or actual damage.</p>
Recommendations and corrective action:	<p>Review and where necessary revise the existing drilling methodology, thus ensuring that it takes account of the findings and lessons learned.</p> <p>Implement a documented safe system of work which takes account of the findings and lessons learned. Particular attention has been paid to how a change in a routine operation is managed.</p> <p>In liaison with the equipment supplier/manufacturer ensure that the equipment complies with “in country” legislative requirement and industry best practice.</p> <p>Consideration must be given to:</p> <ul style="list-style-type: none"> • Speed of rotation in all stages of operation; • Operation of the control lever & the requirement for an isolation switch.