

SIGNIFICANT INCIDENT REPORT NO: 109

FITTING OF TILE BOXES ON DRILLING RIGS

INCIDENT

A driller was struck by a “tile box” assembly which fell from an RC Drilling Rig at a mine in the Goldfields. The “tile box” is a ceramic lined manifold assembly attached to the drill head designed to cope with the high air pressures and abrasive nature of the drill cuttings on the return side of the RC drilling process (see photographs).



“Tile box” Assembly mounted on drill head.



“Tile box” assembly after falling from mast.

The tile box assembly broke away from its welded support fitting and attachment bolts also sheared off from the drill head. The weight of the assembly and return hose attachments was estimated at 300kg.

The driller was standing at his control panel operating the rig when the tile box assembly broke loose under pressure and fell a vertical distance of 6m to 8 m. He was struck by the assembly and suffered severe head and other injuries.



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IMMEDIATE CAUSES AND CONTRIBUTING FACTORS

One of the welded support bracket sections had failed prior to the day of the accident. The remaining weld broke on the day, presumably due to vibration of the high pressure hoses and attachments.

Two of the attachment bolts to the drill head had sheared off the day before the accident and had not been replaced.

The tile box had been replaced the weekend before the accident. In the past, tile boxes had been provided with a safety link whereby a safety chain could be attached to retain the assembly in the event of failed welds or bolts. A fabrication oversight resulted in the new box being supplied without a safety chain attachment. On investigation, it was also established that the new tile box was made for a different rig which had a different arrangement on the mast.

The facts that bolts had sheared and welds had failed indicated that the engineering design was inadequate for the loads placed on the tile box attachments.

COMMENTS AND PREVENTATIVE ACTION

An engineering design review was undertaken by an engineering firm and significant improvements were made to the design of the tile box and return hose attachments. This review included the provision of attachments for a safety chain arrangement to be incorporated in the design.

Where components which are an integral part of such plant are to be fabricated, proper engineering design should be undertaken (including a critical review of the finished design) and approved fabrication drawings should be provided to the persons carrying out the work.

The use of inspection reports and incident reports, backed up by a fault-repair and report-back system, are also valuable tools to identify hazards in machine design and operation and ensure that they are rectified before they cause injury.

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