



**DEPARTMENT OF MINERALS AND ENERGY
WESTERN AUSTRALIA**

SIGNIFICANT INCIDENT REPORT NO. 51

FAILURE OF MAST SUPPORTS ON DRILL RIGS

INCIDENTS

During March 1994, a strut supporting the mast of a drill rig failed at the connection to the main frame; the hydraulic rams prevented the mast from completely collapsing, however the strut failure caused def to the cabin shell and consequently broke a cabin window.

A similar incident occurred during November 1994 when the bracket connecting the boom to the main frame of another drill rig failed causing the mast to fall onto the ground.

Although no injuries to personnel were sustained during these failures, collapses of this type have a high potential for causing serious or fatal injuries.

COMMENT

The strut which failed in the first incident failed in a tension mode. This strut was essentially a compression member.

The bracket that failed in the second incident also failed in a tension mode. This bracket was essentially a shear member.

The failures which occurred in both of these incidents were the result of tensile forces not catered for in the original design of these drill rigs. It is evident that large tensile forces are produced when traversing drill rigs over long distances or rough terrain with the mast raised away from the recommended travel position.

RECOMMENDATIONS

1. The mast of all drill rigs should be secured in the recommended travel position when travelling over long distances or rough terrain.
2. Struts, booms and their connections which support masts should be visually inspected regularly for deformation and cracks with particular attention given to welded connections.
3. Non-destructive testing methods such as Magnetic Particle Inspection or Dye Penetrant Testing should also be used on a planned regular basis to monitor the integrity of struts, booms and their connections.

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SAFETY AWARENESS SAVES LIVES