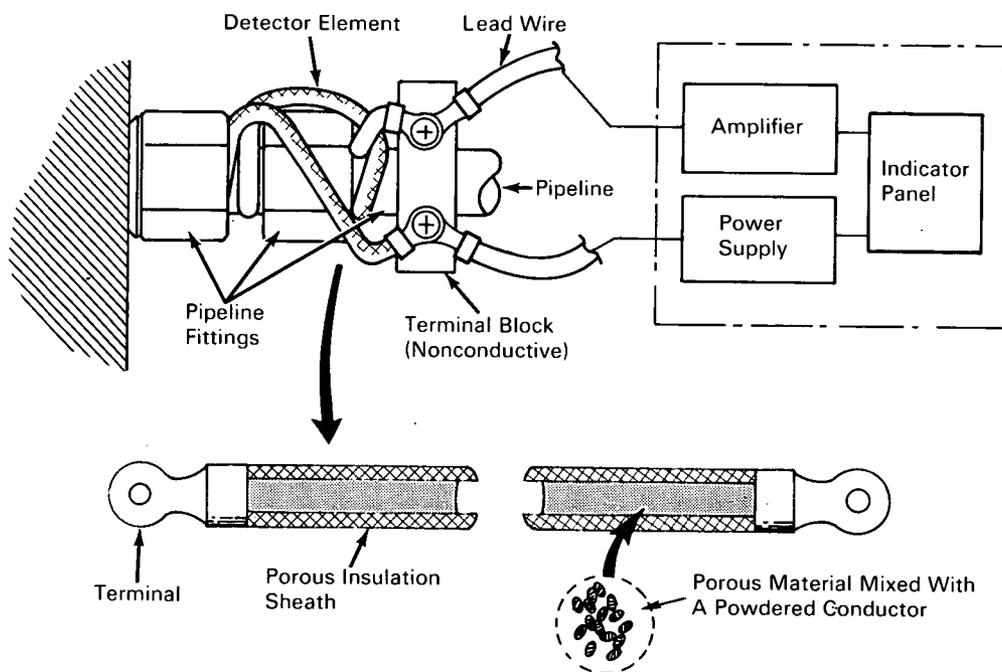


NASA TECH BRIEF



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Conceptual Apparatus for Detecting Leaks of Nonconductive Liquids



The illustration shows a conceptual apparatus for detecting leaks at joints in lines carrying electrically nonconductive liquids, such as oil in the pipelines of a hydraulic system. The proposed apparatus could include a panel that would give a visual or audible indication of a leak (to permit manual shutdown) and/or an electromechanical actuator that would automatically cut off the flow when a leak occurs at any of the monitored pipeline joints. The primary use of the detection apparatus would be in inaccessible areas where visual inspection for leaks would be difficult or impossible, such as in aircraft, ships, submarines, and industrial processing systems.

The leak detector element would consist of a porous insulation sheath containing a porous material (e.g., cellulose) admixed with an electrically conductive powder (copper, aluminum, or graphite). The mixture within the sheath would remain electrically conductive until an oil or other nonconductive liquid saturates the element at some section and breaks or appreciably reduces the conductive continuity of the element. As shown in the illustration, a detector element would be wrapped around pipeline connections where leaks could occur. Terminals attached to the detector element would be connected in series with an electrical power supply, an alarm, and a valve actuator to shut

(continued overleaf)

off the flow of liquid when a leak is detected (within seconds from the time a leak appears).

Note:

This apparatus is presented as a concept only; neither a model nor a prototype has been built as of the date of this Tech Brief.

Patent status:

No patent action is contemplated by NASA.

Source: G. D. Walsh
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