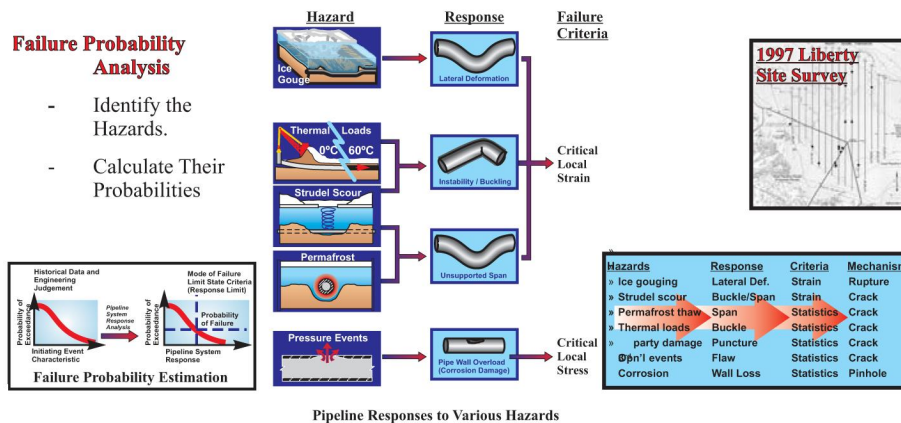


## Risk Assessment of an Arctic Pipeline



### The Requirement

This project focused upon the assessment of risk for multiple conceptual pipeline design alternatives for the Liberty Pipeline which was intended to transport oil from BP Alaska Inc.'s Liberty site to onshore Alaska.

### Approach

For the purposes of this study, risk was defined as the oil volume expected to be released over the planned 20 year life of the Liberty Pipeline.

The study investigated risks due to ice gouging, strudel scour, permafrost thaw subsidence, thermal loads leading to upheaval buckling, corrosion, third party activities and operational failures.

### Outcome

Event probabilities were established for these hazards by analyzing a combination of event trees and failure statistics.

The pipeline responses to the hazards were evaluated and failure criteria established.

A consequence model was developed to quantify the oil volume released during pipeline failure, taking into account the expected performance of the monitoring systems that are intended for use.

The risk was then calculated by summing the risks for the individual hazards.