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# Pipeline Repair Management – Planning – Execution with due Consideration of Business Interruption and HSE risk

## Unplanned Repair

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*Penspen Integrity, UK*

# Be Prepared

# REPAIR: Caution.

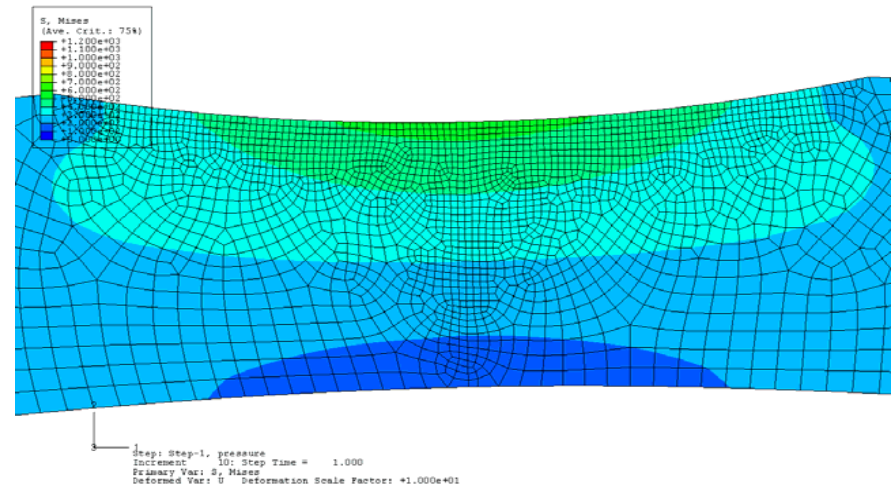
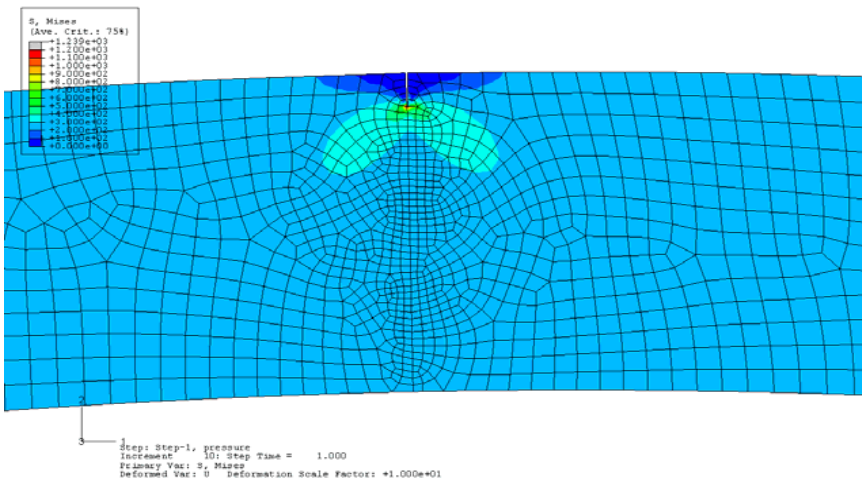
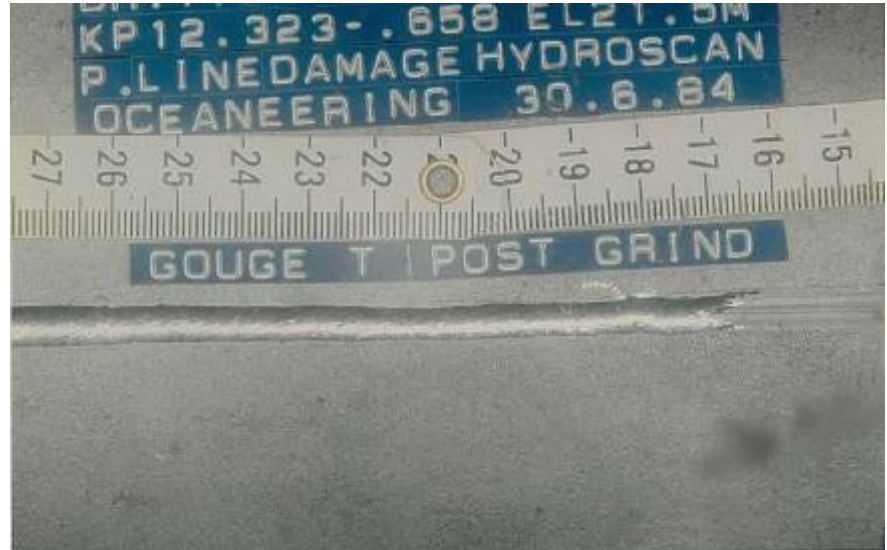
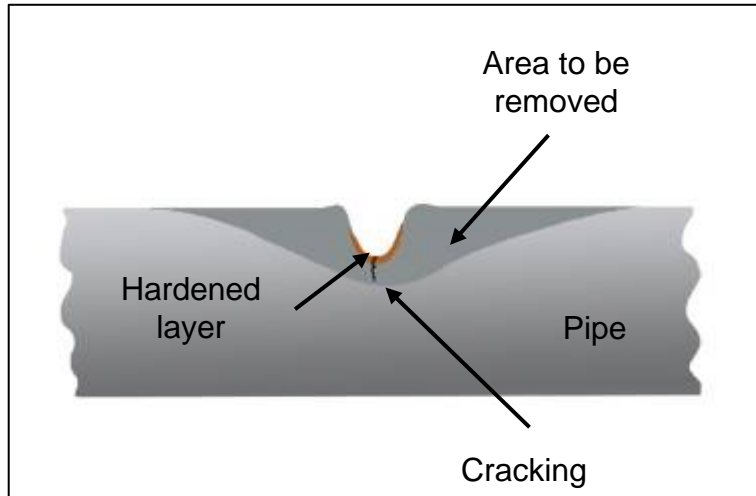


- **Some wise words on repair\*:**
  - **‘Do no harm!’**
    - A bad repair can make matters worse.
    - Repairs need careful engineering, at least as much as a new construction.
    - Do not act in haste.
  - **A repair is often not a good time to try something new.**
    - There is less experience with a new procedure, compared to tried and tested designs. Surprises may occur with uncertainty and incompletely planned engineering

# Offshore Pipeline Repair Options

- **Grinding**
- **Clamps**
- **Section Replacement**
  - **Connectors**
  - **Hyperbaric welding**
  - **Recovery to surface**

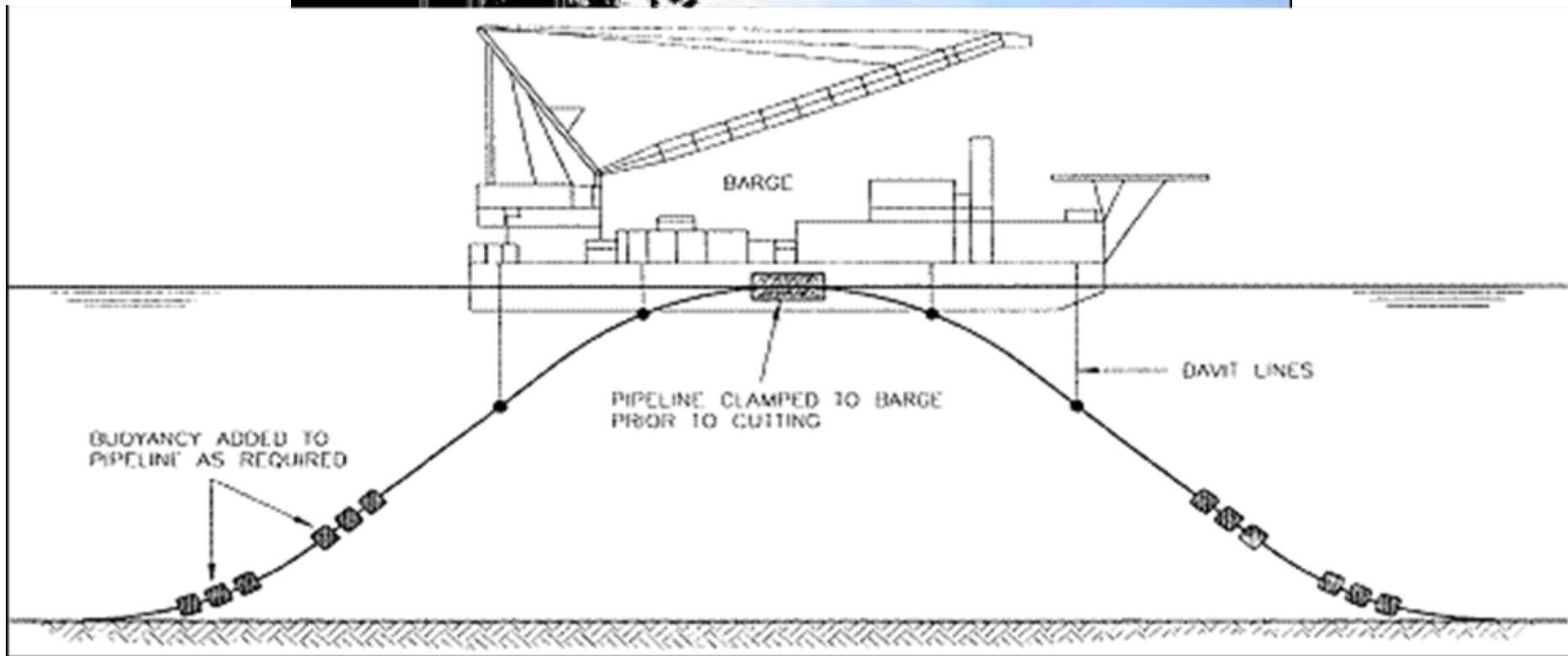
# Grind repair



# Clamps



# Section Replacement





# Repair Management

- Pipeline operator
- Vessel operator
- Diving contractor
- ROV operator
- NDT contractor
- Defect specialists
- Welding
- Re-commissioning
- Subsea designer
- Verification agency/consultant
- Equipment suppliers
  - Pipe handling
  - Concrete removal
  - Pipe cutting
  - Clamp or connectors
  - Welding habitat
  - Isolation tools
  - De-watering pigs
- Regulator



## CATS CASE STUDY