Operational Excellence Services

Reliability & Maintenance

Plant Life Extension Program (PLEP)

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Plant Life Extension Program (PLEP)

Do you have any issues about plant materials ?

☹ **Plant Aging**

Approaching the life, material degradation is accelerating…

☹ **Operating Condition Changing**

Conditions becoming more severe, deviating the design range…

☹ **Competitiveness Stagnating**

O&M cost increasing, maintenance intervals shortening…

PLEP Solutions

- Identification of facility and locations having materials and inspection concerns
- Suggestion of practical and economical solutions to solve the concerns
- Projection of revamp work, inspection and maintenance work, etc., to extend plant life

Example of issue:

Furnace tube bowing

- Cause

  Bowing on the specific location

  → Main cause: coking

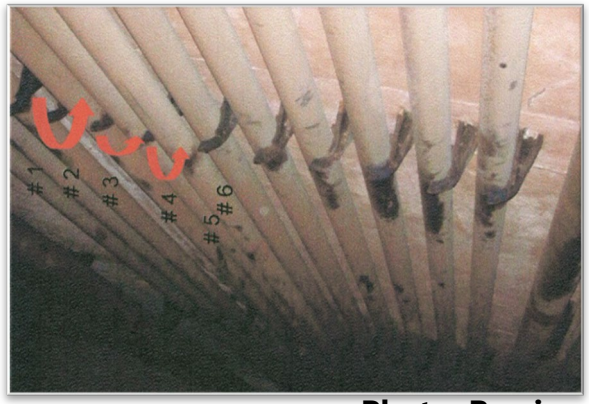
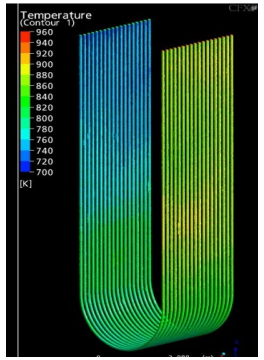


Photo: Bowing

- Countermeasures
  - Periodical IR Monitoring (Hot Spot Monitoring)
  - Periodical Pigging
  - Visual, DPT, UTTM, Creep/PI.Tape, PMI, Hardness, etc.

- Recommendation for Life Extension
  - To measure circumference length on bowed and sound tube periodically in order to assess the creep in every shutdown.
  - CFD modeling and consultation may be an option for detailed assessment.



CFD Analysis

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Plant Life Extension Program (PLEP)

PLEP for preventing troubles in advance…

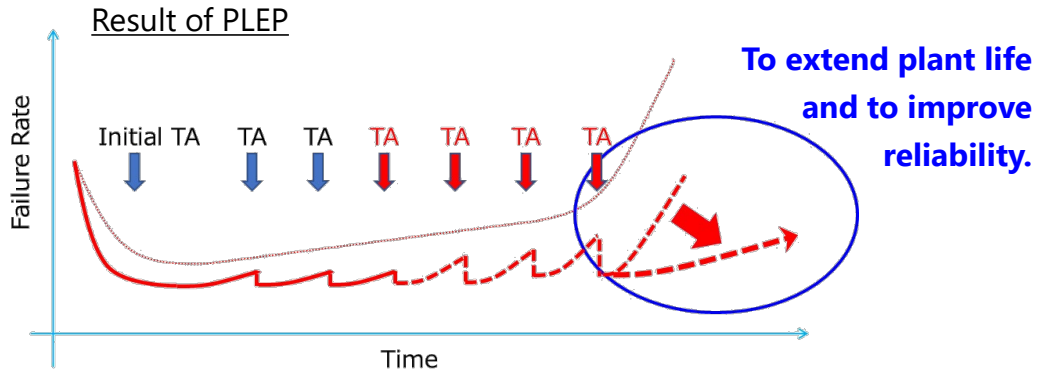
Workflow & Result

1st Step - Plant Integrity Assessment (PIA) : Finding / Screening

- ✓ Assessment of materials selection, inspection program, etc.
- ✓ Site visit and discussion with client.

2nd Step - Integrity Improvement Initiative (III) : Detail Study

3rd Step - Life Extension Project (LEP) : Project Development and Execution



Our Strengths

- ✓ **One-stop** service of engineering, construction and maintenance services to make convenient for client
- ✓ **Practical and efficient** approaches including workshops and site observations will provide best solutions
- ✓ **Easy** methods without special software will avoid client burden
- ✓ **Flexible** program will run along with client's demands to the goal.

Our Experience

- ➢ **CDU/VDU**, Asia

  83 findings / 22 recommendations
- ➢ **Gas Processing Unit**, Middle East

  116 findings / 34 recommendations
- ➢ **GOSP**, Middle East

  88 findings / 7 key recommendations

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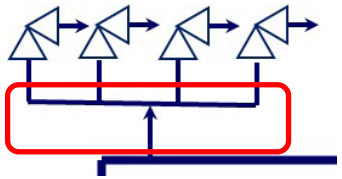
Plant Life Extension Program (PLEP)

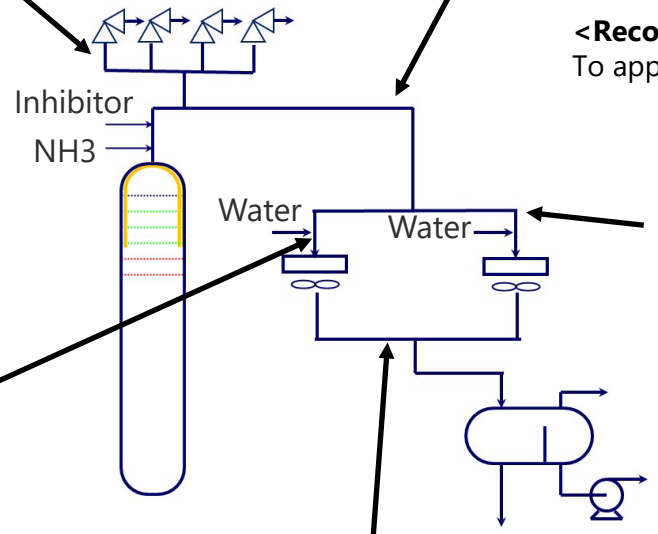
Return to Reliability & Maintenance menu



✓ TML setting at RV manifold

<Finding>
Severe condition is expected because of stagnant condition.

<Recommendation>
To set thickness measurement locations (TMLs) around the manifold.



✓ Hot insulation setting

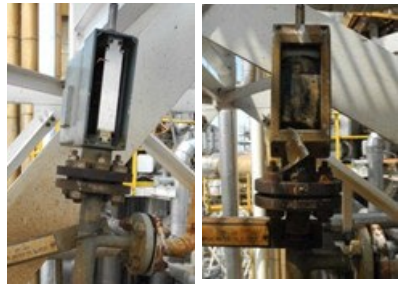
<Finding>
Due to inadequate length of hot insulation, corrosive water condense, and it induce severe corrosion.

<Recommendation>
To apply hot insulation.

✓ Assessment of flow distribution

<Finding>
The actual corrosion rate is significantly different between old and new bays (condensers), and it suggests uneven flow distribution.

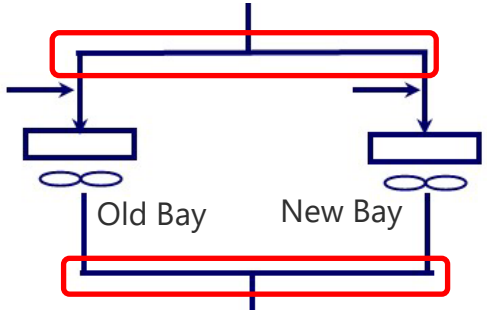
<Recommendation>
To conduct flow distribution analysis.



✓ Flow-meter trouble

<Finding>
Flow-meter malfunctioned, and flow rate could not be measured

<Recommendation>
To fix the flow-meter and to adjust proper injection rate.



✓ TML setting at condenser downstream

<Finding>
Corrosion monitoring device is installed, but thickness measurement location was not set.

<Recommendation>
To add thickness measurement locations to monitor actual corrosion rate. This can also check the efficiency of corrosion inhibitor and NH3 injection at upstream.

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