

# DEGRADATION ASSESSMENT AND INSPECTION OPTIMIZATION WITH COMSY

Condition-Oriented Aging and Plant Life Management System

**Plant-wide degradation prognosis allows for an optimized and cost-effective maintenance and inspection strategy, while supporting risk based inspection concepts**

## Challenge

Changing energy markets require power plants to operate with more flexible loads. In addition, pressure is increasing to keep costs down by optimizing maintenance and inspection activities for realistic needs.

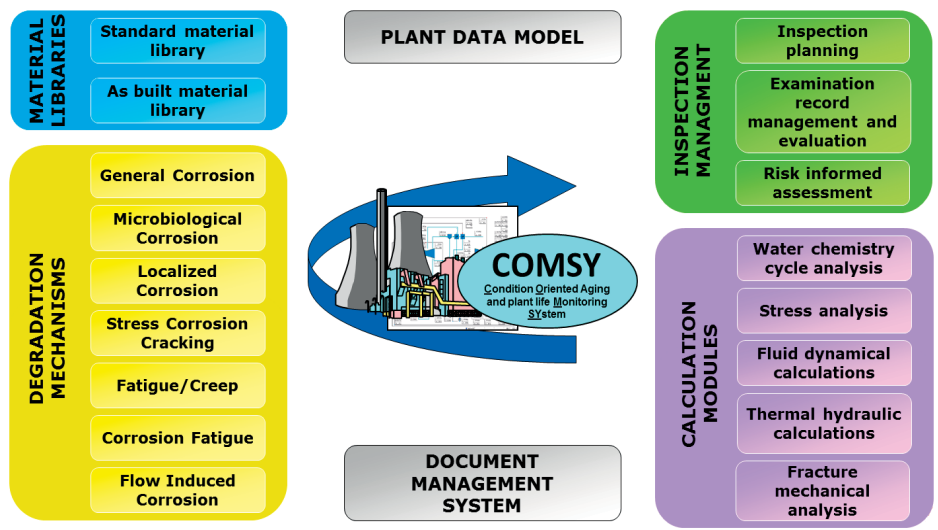
## Solution

The COMSY software solution is an efficient predictive system which is capable to provide life cycle management and realistic condition assessment for power plant components based on the individual operation conditions. With its integrated degradation assessment modules, the program enables the design and setup of a living program with optimized maintenance and inspection concepts. System areas sensitive to creep, fatigue, flow-accelerated corrosion (FAC) pitting, crevice and other degradation mechanisms can easily be identified and evaluated. The software integrates degradation analysis and trending techniques to optimize the inspection, maintenance and repair strategy. Furthermore, case studies can be carried out to investigate the effect of e.g. higher start up gradients.

Maintenance needs for active components (e.g. valves, pumps, etc.) can be assessed based on industry experience regarding symptoms and root causes of system malfunctions. The active components evaluation with COMSY provides the technological basis for predictive/prognostics capabilities by providing a range of reliability performance indices for key power plant components. The evaluation of maintenance feedback utilizes statistical information to optimize the effort according to economic criteria considering availability and safety requirements. This includes probabilistic approaches to determine updated MTBF (mean time between failures) values for the components considered using the Weibull approach to resemble aging effects.

## Customer benefits

- Predictive calculation of degradation progress for piping and components
- Determination of the remaining lifetime based on design criteria
- Determination of individual inspection dates for all components at risk with the support of Risk informed prioritization methodology
- Identification and evaluation of operation modes margins
- Design studies for new plants or power uprates regarding the optimization of material selection and geometry.



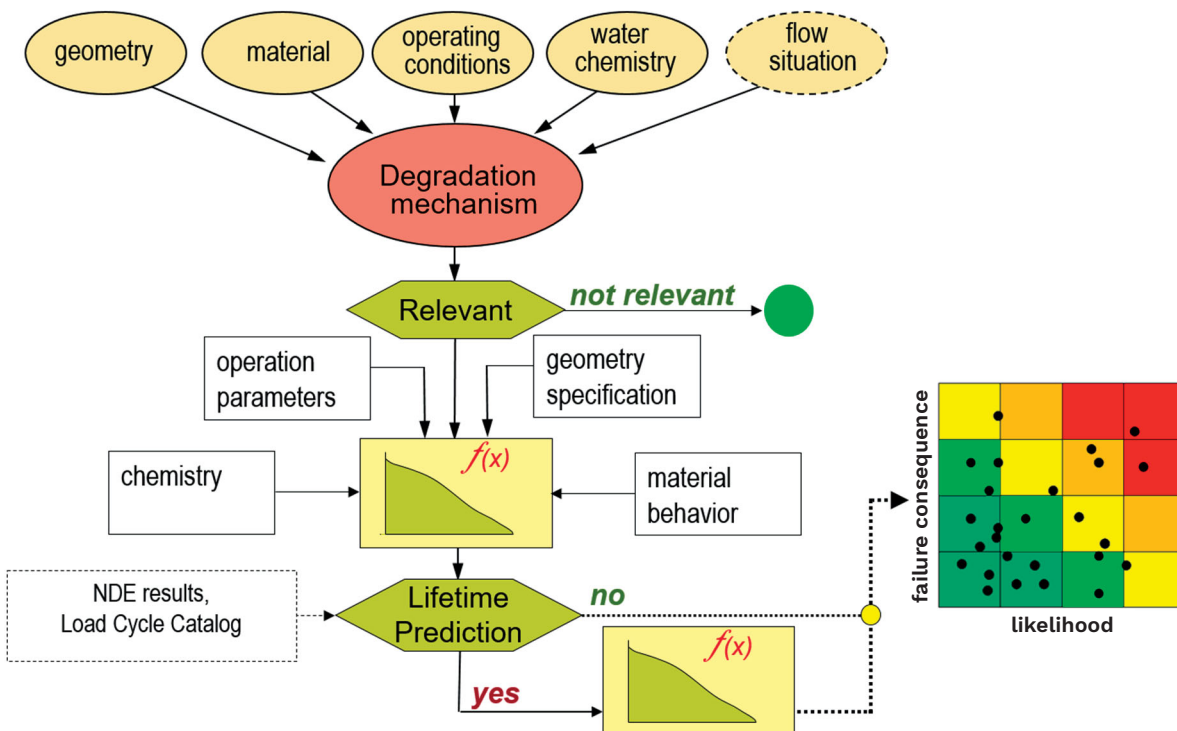
COMSY Software Modules

## Technical information

Framatome methodology to optimize inspection programs uses reliable condition based degradation assessment. The predictive models integrated in COMSY are based on our more than 30 years of experience in the evaluation of degradation effects and numerous experimental studies. The software assisted approach for risk based inspection (RBI) planning allows for a comprehensive, cost reducing and safety increasing maintenance strategy for a large stock of systems and components. The main objective is to generate a dependable ranking of components or locations to be inspected based on the insights from the consequence assessment and degradation potential evaluations.

The Lifetime predictions for degradation mechanism:

- General Corrosion, Shallow Pitting
- Pitting and Crevice Corrosion
- Microbiologically induced corrosion
- Stress Induced Corrosion Cracking (IGSCC, TGSCC, Ni-SCC)
- Thermal transient fatigue
- Corrosion Fatigue
- Thermal cycling and stratification fatigue
- Creep
- Flow-accelerated corrosion (FAC)
- Cavitation erosion
- Droplet impingement erosion
- Solid Particle Erosion



Methodology on degradation assessment and inspection optimization

## 30 Years of experience

**Your performance**  
is **our everyday commitment**

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