

Energy Cost of Waterside Fouling In Industrial Equipment

Energy is by far the largest component of the total life cycle cost of most energy-using equipment!

Country	Fouling (\$ Million)	1992 GNP (\$ Billion)	Fouling Cost/GNP %
UK	2500	1000	0.25
US	14,175	5670	0.25
New Zealand	64.5	43	0.15
Germany	4875	1950	0.25
Japan	10,000	4000	0.25
Australia	463	309	0.15
Total Industrialized World	45,029	22,510	0.20

The evidence shows that fouling on the waterside of your equipment will increase your energy cost tremendously. Current methods of maintenance/cleaning would not be able to address this problem as equipment is not cleaned to bare metal and fouling is spread over a large surface area.



SAVES \$\$\$\$\$\$\$\$\$\$\$\$\$ A good proactive/predictive maintenance program, with regards to waterside fouling, reduces unplanned shutdowns, astronomical energy and operational costs, lower maintenance budgets and maintaining optimum operating efficiency in equipment.

The effectiveness of heat exchangers is reduced with the increase in thermal resistance; even a minute layer of fouling reduces thermal conductivity.

Plainly stated, the growing cost of maintenance is a serious business problem. According to DuPont, "maintenance is the largest single controllable expenditure in a plant: in many companies it often exceeds annual net profit."

One major U.S. automotive manufacturer has a maintenance staff of between 15,000 and 18,000, all plants combined. They say, "85% to 90% is crisis work" (breakdown).

Due to the:

1. Introduction of new water continuously,
2. Existing fouling in the piping system,

Fouling cannot be avoided in everyday situations, it can only be minimized.

Two basic and effective ways to reduce energy costs that apply to all energy production, distribution and end-use categories are:

1. To reduce the load or need for energy
2. Increase the operating efficiency of energy-using equipment

Maintenance Strategy	Technique Needed	Human Body Parallel
Proactive Maintenance	Monitoring and correction of failing root causes, e.g. periodic removal of water based scale with BIO	Cholesterol or blood pressure monitoring with diet control
Predictive Maintenance	Monitoring of vibration, heat, alignment wear, debris.	Detection of heart disease using EKG or ultrasonics
Preventive Maintenance	Periodic component replacement	By-pass or transplant surgery
Breakdown Maintenance	Large maintenance budget	Heart attack or stroke