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Explanatory notes have been added.

Proceedings of

THE 1990

INTERNATIONAL MAINTENANCE MANAGEMENT

CONFERENCE

Melbourne 20, 21, 22 August 1990

Sydney 22, 23, 24 August 1990

PAPER 9

**THE MAGNETIC TREATMENT OF WATER FOR SCALING,
CORROSION AND BIOLOGICAL CONTROL - FACT OR FICTION**
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THE MAGNETIC TREATMENT OF WATER FOR SCALING, CORROSION AND BIOLOGICAL CONTROL - FACT OR FICTION

Magnetic treatment device (MTD) is another name for magnetic fluid conditioner (MFC)

Note:- (1) the climatic conditions in Victoria, Australia are such that a building cooling tower air-conditioning system typically operates for only 4 (to 6) months each year (December to March). This system required cleaning of the cooling tower and condenser at least once every 2 (to 3) months during summer.

(2) this cooling tower system was located adjacent to an open cut brown coal mine and suffered from a chronic scale and sludge problem due to hard water and the ingress of air born matter. The condenser tubes regularly required mechanical cleaning in addition to chemical cleaning to remove the scale.

THE AUTHORS EXPERIENCE WITH MTD'S

In 1988 a MTD was installed on an air conditioning system that consistently required condenser cleaning twice per year.

During its operating period a return air temperature of 23°C is required to keep the unit running. The daily "off" time cycle is from 2230 hours to 0600 hours, i.e. seven hours, thirty minutes.

The condenser of the A.C. system is water cooled with a closed circuit of cooling tower and pump circulating the water.

Consistent with the Victorian Health Department requirements this water was treated with a biocide.

By law the Victorian State government requires all cooling towers to be treated with biocides. Dosing with biocides only was continued.

Dosing with scale and corrosion inhibitors was discontinued.

The system used was P.S. Australian Promotions Pty Ltd (trading as **Magnetic Technology Australia**) magnetic fluid conditioners clamped externally to the pipe supplying the water cooled condenser. The factors influencing the selection of clamp-on magnet system were:

virtually no installation costs.

Was non-intrusive in that it did not require "cutting-in" to the water system.

no power supply required.

it treated the complete water flow and not a "by- pass" system.

The system was in place on 12th August 1988 and regularly inspected and photographed up to June 1990. During this period of nearly two years the condenser has not required cleaning - scaling and sludging have been non existent.

Note:- Prior to installation of the MFCs the system required descaling every 2 (to 3) months during the summer operating period. With the MFCs installed the system did not require descaling again, that is, scale formation was totally eliminated.

Be prepared to clean the system of sludge initially on an increased frequency as the desludging/descaling effect takes hold. As the treatment proceeds this cleaning - at the low velocity point - will reduce in frequency.

The low velocity point in the system referred to was the cooling tower basin.

It was also noted a small series of corrosion blisters appeared during the April, May, June 1989 period. Until that time the corrosion pattern on the cast iron end plate of the condenser was unchanged. This was not the case pre MTD treatment when chemical treatment was applied.

The April, May, June 1989 period was a period where the Air Conditioning System did not operate as the heating cycle was required. Consequently the chiller would be out of service and hence no circulation of the water through the magnetic field for that period of time.

Note:- 1. Before installation of the MFCs when corrosion inhibitors were used the corrosion blisters on the cast iron end plate continued to grow.
2. When the MFCs were installed dosing with corrosion inhibitors was discontinued.
3. During the months when the A-C system was in operation there was NO growth in the corrosion blisters.
4. During the months when the A-C system was not operating – and thus no MFC treatment was occurring – the corrosion blisters began to grow again.