

More TECHNICAL BRIEFS

years, Fig. 2. The author discusses their use and limitations.

The most recent (both about 15 yrs old) are the "controlled scale deposition" method based on the Langlier Saturation Index and the "threshold treatment" employing a glassy phosphate.

The Langlier system depends on establishing a thin but dense coating of calcium carbonate to protect metal surfaces against corrosion but not cut down too greatly on heat transfer. But because there are wide variations of water temperature within a single cooling system, the job of laying down the most desirable uniform layer is often complicated.

The glassy phosphate method is held to be simpler in application. It must be remembered, however, that there is a definite limit to the amount of hardness you can stabilize with glassy phosphates, and supplementary treatment methods are often in order. *ESWP Paper. No number.*

A Review of Testing Techniques in Cooling Towers. By J K Rice, Cyrus Wm Rice & Co.

Testing procedures for determining the effectiveness of cooling water treatment may be classified as: (1) coupon (2) sample unit (3) full scale. Any one of these procedures may be used singly or in conjunction with one or both of the other two depending on completeness of desired information.

Coupon procedures are the most familiar. They are the ones in which a relatively small sample of the material is subjected to a given environment for testing purposes. Results, though, cannot be taken as relative to results in actual full scale operation unless and until a direct correlation is obtained in each particular environment.

A sample unit is a small portion of a full scale system wherein the sample is dimensionally similar and subjected to the identical environment of the full scale unit. As an example, the sample unit might be a section of pipe, tubing, valve or fitting. Chief disadvantages are cost of sample, job of removing and inserting them in the full scale environment, and cost of operating them.

Full scale unit procedures are the final, and for a given environment, the only accurate procedures. The measurements you take with a full scale unit are operating data, costs, hours between cleanouts, cost of cleanouts, tube life, changes in water side heat transfer. *ESWP Paper. No number.*

Water Treatment

Deionization vs Evaporation of Hard Water Supplies For Boiler Makeup. By T C Happe and R A Russell, Black & Veatch Co.

The authors feel that the subject of deionization of waters with less than 150 ppm of dissolved solids has been widely discussed and its advantages well known. There is, though, a scarcity of data on deionization of waters of 500 ppm of total dissolved solids and above.

Makeup water of acceptable quality for the higher ranges of boiler operating pressures can be produced by evaporators or compression distillation. For the lower ranges the choice may be hot lime-soda, hot lime-phosphate, hot or cold lime-zeolite. Deionization, though, is available to both. Economic considerations, then, are frequently the deciding factor. Proper selection of the pre-treatment process, as well, can result in reduced operating costs for the boiler makeup water conditioning equipment.

The authors set down the following analysis of the evaporator and the deionization methods.

The evaporator has these advantages: the method is a conventional one, well understood by plant operators and boiler water consultants; operating

costs are independent of variations in water analysis and chemical space requirements are small since chemical storage is needed. On the opposite side of the ledger as disadvantages are: rate of makeup production frequently depends on plant electrical load, the equipment can't be in advance of plant start-up; bicarbonate makeup the evaporator carries off CO₂ which requires deaerator for reduction; periodic cleaning and scale removal are needed; best operation unless makeup is treated; if ammonia is present it is properly removed.

Deionization has these advantages: serves as a source of high quality water for start-up and refilling boiler scheduled outages; operation is independent of electrical production and produces high quality water at low rates to satisfy any unusual demands that may develop; makeup quality stays consistently better than evaporators; equipment can be put anywhere in the plant with piping connections few and simple.

In the deionization disadvantage column the authors state: It requires periodic shutdown for regeneration, exchange resins and close attention by the operator during regeneration; may need additional storage space for chemicals.

The authors sum up their story with the expression that the trend seems to be to greater use of deionization. *ESWP Paper. No number.*

Experiences with Chloride Anion Exchangers for Reducing Alkalinity. By S B Applebaum, Cochrane Corp.

You can reduce alkalinity by one of three standard methods: lime with the hot or cold process; sulfuric acid followed by aeration or deaeration; or hydrogen zeolite, again followed by aeration, deaeration and repumping. By each of these methods carry with them certain distinct drawbacks where smaller plants are concerned. The author, however, describes an answer to these objections involving use of a relatively new method of alkalinity control by means of the chloride anion.

There are five major advantages the author sees it: (1) No acid is needed at all. (2) No acid-proof linings, piping and valves are required. (3) Salt is employed and is readily available at low cost. (4) Aeration is eliminated for CO₂ removal. (5) Repumping is avoided because chloride

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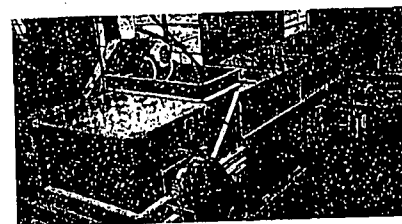
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Material for these abstracts comes from the following sources unless otherwise stated. Order complete paper from source, not Power.

Engineers Society of Western Pennsylvania, annual meeting, Wm Penn Hotel, Pittsburgh, Pa, Oct 20-22, 1952, identified by initials ESWP. Obtainable through H M Porter, sec, ESWP, Hotel Wm Penn, Pittsburgh, Pa.

American Society of Mechanical Engineers, Industrial Instrument and Regulator Division, Seventh National Instrument Conference, Cleveland, Ohio, Sept 9-10, 1952. Identified by initials IIRD and ASME. Fall meeting held in conjunction with Centennial of Engineering, Chicago, Ill, Sept 9-10, 1952. Available through ASME, 29 W 39th St, New York 18, N. Y.

READER SERVICE SECTION



One of the many enclosed Fairfield Belt Conveyors discharging bark into the "live-bottom" bin atop the boiler house



Screw conveyor built into bottom of the Fairfield "live-bottom" bin feed the bark into the stokers.