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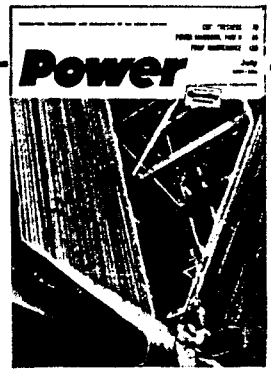
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Power

JULY 1951 VOLUME 95 · NO. 7

combined with Operating ENGINEER



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BOILERS are big business on the West Coast these days. Long a hydro stronghold, California now turns to steam power as booming demand outstrips water-power potential.

Our cover catches this trend in an impressive shot of a B & W radiant boiler at Pacific Gas & Electric's Moss Landing Station. Wielding the ratchet hoist is a member of the C C Moore Co erection crew.

Boiler is one of six 475,000-lb-per-hr units supplying three 100,000-kw turbine-generators. One of these machines has been operating about a year, other two see service soon. With two more turbine-generators and their boilers planned for 1952, this 1300-psi 950-F outdoor plant promises to be the largest west of the Mississippi. But these days who can tell?

Next month...

■ Right in the heat of the baseball season we're pulling a triple play of our own. In August you'll find the lowdown on wells and well pumps in—count em! —three places: basic facts in the E&M section, care and repair in PO&M, tips on testing in the Data Sheet. Be sure you cover all bases!

■ At Sewaren they've gone all out to get maximum makeup purity. You'll see why in August's story on how they treat city water for evaporator feed.

■ Another *Man of Action* story takes you to Eastman Kodak's Hawkeye plant, tells you how Wayne Farrell keeps on top of his job of making this plant tops in efficiency, cleanliness.

■ Got some electrical equipment to hang on a wall? Grab Jim O'Connor's "baby" special section on anchors—that's where you'll find all the new wrinkles—and tested old ones—for doing the job quickly and easily.

...and future months

■ Being readied for October: a 16-pg handbook on fans (both draft and ventilating). It'll cover basic fan facts, types and arrangements, construction, fan characteristics, drives and control, selecting and applying fans, operating and maintaining them.

FIGURING HEAT LOSS, ECONOMIC THICKNESS

Table*, lower right, shows loss for various thicknesses of 85% magnesia insulation applied to pipelines or flat surfaces 300 deg F hotter than surrounding air. Data can be used approximately for such insulations as mineral wool and sponge-felted asbestos. If temperature difference is greater or less than 300 F, apply factor from chart.

EXAMPLE: A 220-ft run of 4-in. pipe insulated with double-standard insulation carries process steam (saturated) at 600 psig through a room at 80 F. What is hourly heat loss?

Solution. Pipe temperature is 490 F, from scale, so temperature difference is 410 F. Factor from chart is 1.45. Loss per ft of pipe run at 300 F, from table, is 89.4 Btu. Total loss is 89.4 × 1.45 × 220 = 28,500 Btu per hr.

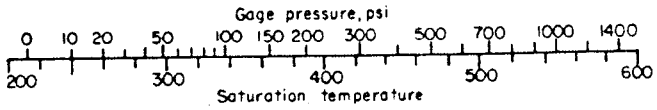
ECONOMIC THICKNESS. To figure economic thickness for insulation, draw up a table for the specific job similar to one shown below for a heater.

Thickness, inches	Total insulation cost installed	Total yearly dollar loss	Cost of added insulation thickness	Added saving	Years for added saving to pay added cost
0	—	$720	—	—	—
1	$200	180	$200	$540	0.37
1½	260	126	60	54	1.11
2	318	96	58	30	1.93
2½	374	76	56	20	2.80
3	429	62	55	14	3.92

Then pick the thickness that pays off in the time required by your plant's financial policy. If insulation above has to pay off within three years, use 2½-in.

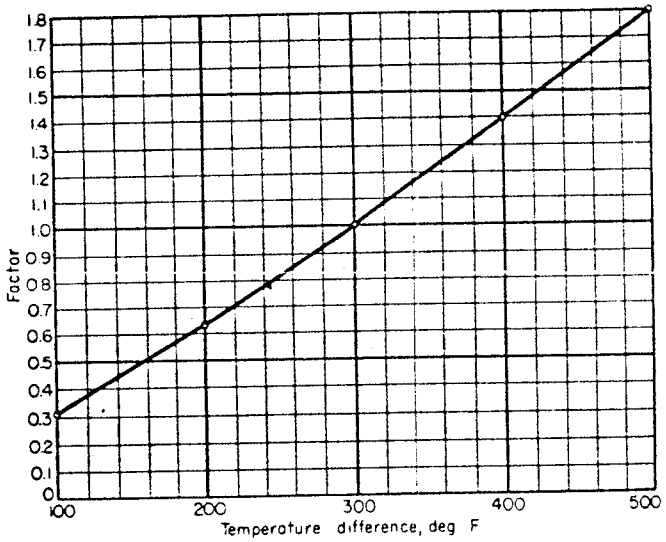
*From Magnesia Insulation Manufacturers Association.

PRESSURE-TEMPERATURE SCALE



TEMPERATURE CORRECTION FACTOR

(Based on 300-deg F temperature difference as normal)



COMMERCIAL INSULATION

KINDS AND SHAPES OF HEAT INSULATION FOR WARM SURFACES	Hair	Air-cell asbestos	Asbestos, fibrous	85% Magnesia	Sponge-felted asbestos paper	Mineral wool	Diatomaceous silica (calcined)	Diatomaceous silica (calcined brick)	Crumpled aluminum foil
Usual max temperature	200 F	300 F	750 F	600 F	700 F	1000 F	1900 F	2500 F	
Loose or granulated				✓		✓	✓		
Cement			✓	✓		✓			
Blankets or batts	✓	✓				✓			
Sheets (flexible)		✓	✓		✓	✓			✓
Boards or blocks (stiff)		✓	✓	✓	✓	✓	✓		
Molded segments				✓					
Shaped sections	✓	✓	✓	✓	✓	✓	✓		
Bricks								✓	

HEAT LOSS THROUGH 85% MAGNESIA

(Multiply by correction factor from above chart)

Pipe size, inches	Insulation thickness, inches	Heat loss, Btu*
1/2	7/8 (s)	51.9
	1 1/2	40.8
	1 29/32 (ds)	36.9
	2	36.2
	2 1/2	33.0
	3	30.9
3/4	7/8 (s)	59.1
	1 1/2	45.7
	1 29/32 (ds)	41.1
	2	40.2
	2 1/2	36.5
	3	33.9
1	7/8 (s)	67.8
	1 1/2	51.7
	1 29/32 (ds)	46.0
	2	45.0
	2 1/2	40.7
	3	37.5
1 1/4	7/8 (s)	79.5
	1 1/2	59.2
	1 29/32 (ds)	52.4
	2	51.1
	2 1/2	45.7
	3	42.0
1 1/2	7/8 (s)	86.7
	1 1/2	64.2
	1 29/32 (ds)	56.6
	2	55.1
	2 1/2	49.2
	3	45.0
2	1 1/32 (s)	92.4
	1 1/2	74.0
	2	63.0
	2 5/32 (ds)	60.5
	2 1/2	55.8
	3	50.6
2 1/2	1 1/32 (s)	106
	1 1/2	84.3
	2	71.1
	2 5/32 (ds)	67.8
	2 1/2	62.4
	3	56.6
3	1 1/32 (s)	123
	1 1/2	96.9
	2	81.0
	2 5/32 (ds)	77.4
	2 1/2	70.8
	3	63.5
3 1/2	1 1/32 (s)	137
	1 1/2	107
	2	88.5
	2 5/32 (ds)	84.7
	2 1/2	77.3
	3	69.4
4	1 1/8 (s)	141
	1 1/2	116
	2	96.5
	2 1/4 (ds)	89.4
	2 1/2	83.6
	3	74.7
5	1 1/8 (s)	170
	1 1/2	138
	2	113
	2 5/16 (ds)	103
	2 1/2	97.5
	3	86.4
6	1 1/8 (s)	195
	1 1/2	158
	2	129
	2 5/16 (ds)	117
	2 1/2	111
	3	97.8
8	1 1/4 (s)	225
	1 1/2	197
	2	160
	2 1/2 (ds)	136
	3	119
10	1 1/4 (s)	272
	1 1/2	238
	2	192
	2 1/2 (ds)	162
	3	141

Flat insulation blocks with 1/2-in. asbestos cement finish.	1	96.2**
	1 1/2	69.9
	2	54.9
	2 1/2	45.2
	3	38.4
	3 1/2	33.4
	4	29.5

(s) Standard thickness (ds) double-standard thickness.

* Btu per hour per foot of pipe length at 300-deg-F temperature difference.

** Btu per hour per square foot of insulation surface at 300-deg-F temperature difference.