PLAINTIFF'S EXHIBIT
CHV-837

Memorandum

El Segundo Refinery
July 5, 1978

REVISED REMOVABLE INSULATION SPECIFICATION

MR. D. L. BROWN:

The latest removable pad specifications (March, 1978) require a layer of stainless steel foil to cover the inner insulating material. In the Hitco CRES pads, this foil layer is the outer "skin" in contact with the valve or flange surface. This specification was added in October, 1977, due to problems with the original Hitco pads. The first-generation Hitco pads had a single layer of 0.001" aluminum foil next to the surface being insulated. This foil could not stand up to normal refinery handling and hot surfaces. It rapidly deteriorated exposing the inner Fiberglas pad. This was considered unsafe, and the requirement for stainless steel foil ensued.

Hitco revised their first generation pad shortly after these problems to include two layers of 0.002" aluminum foil as the inner skin. This is their "second-generation" pad. Just prior to changing our specifications to require stainless steel foil, we purchased these double-foil pads for the Pro-Poly Plant, Coker, and No. 2 Crude Unit. Most of these pads have been in service about nine months now.

I recently checked a number of these second-generation Hitco pads to see how two layers of aluminum held up to normal refinery service. Thirty pads in the PPP and Coker were inspected. Both flange and valve covers, in service up to 650°F and ranging from 2" to 12", were checked. Two manway covers on a PPP reactor were also inspected. The results of this inspection are as follows:

1. Of the 28 flange and valve pads inspected, six had small tears through both layers of foil exposing the insulation. However, except for two of the pads, all the tears were near the outer edges of the pad, and were apparently caused by stud punctures. They would not be a hazard in service, and could be reused. Two of the pads had large tears through both foil layers. Although reusable from an insulation standpoint, they would be susceptible to oil soaking, and should be replaced. (The number of times these pads had been removed and replaced is unknown.)

2. On valve covers, there were typically several small tears through one layer of foil at the edge of the valve bonnet cutout. These would not affect reliability or reusability.

3. Pads in dirty, oily/coking service (leaking flanges) showed no signs of deterioration, and were remarkably clean inside.

4. The aluminum foil "crushes" around the valve or flange surface, creating a tight heat barrier. This is a real disadvantage to Hitco's third-generation CRES pad with its relatively non-conformable stainless steel foil.

5. The two PPP reactor manway covers have been removed and reinstalled numerous times at catalyst change-outs. They take a terrific beating, and as expected, both pads had several tears through both layers of foil. There was no evidence of inner insulation deterioration or hydrocarbon contamination, and both pads were still doing a fine job of insulating. In extreme cases like this, it will probably be necessary to replace at least some of the pads every year.

Based on these inspections, I believe we have been overly conservative in requiring the use of stainless steel foil in our current specifications. In the case of Hitco pads, their double-layer aluminum foil pads meet our criteria well enough to continue their use. There is a considerable cost advantage in eliminating stainless steel foil with minimal loss in reliability.

The attached specification has been revised to accept either stainless steel foil or two layers of aluminum foil. Should future inspections contradict the results of my study, we may reimpose the stainless foil requirement. For now, we will use this newest specification in all future bidding.

M A Bell 7/5/78

M. A. BELL

MAB:msk
Attach.
cc: RMA
JPE
GNM

REMOVABLE PAD SPECIFICATION

A. All removable pads must be suitable for hydrocarbon service, whether used in hydrocarbon or steam service.

1. All pads must be designed and constructed for a minimum life of two years with typical handling by refinery maintenance forces. The removable pad must be able to withstand general refinery use without mechanical failure.

2. Insulation inside the removable pad must be protected from absorbing any liquids or vapors originating at the flange or valve surface. A water resistant outer coat and a hydrocarbon proof barrier between the equipment and the pad insulation are minimum requirements.

3. Pad covering material in contact with flange or valve surfaces must allow reasonable drainage. Fiber glass cloth, stainless steel foil, or two layers of aluminum foil are acceptable as inner surface materials, consistent with Item A.1 above.

4. Removable pads must have a permanent hole or slot in the bottom to allow drainage of liquid drips. The width of the slot must be 3/8" - 5/8".

B. Temperature Requirements

1. Removable pads must be able to withstand a continuous inside surface temperature of 750°F.

2. The outside surface temperature of the insulation must be less than 140°F. This includes lacing hooks or capstans.

C. The exterior of the removable pad must be water resistant over the life of the pad as a minimum requirement.

D. Inner surface material used to protect the insulation inside the removable pad from absorbing liquids or vapors originating on the equipment being covered, must include a layer of stainless steel foil or two layers of aluminum foil. This foil must cover the entire inner surface of the insulation inside the removable pad. The foil must also cover this insulation on its exterior, along the drainage slot edge, to a distance 3" from the edge of the pad.

E. Fastening devices such as lacing hooks or gromets must be securely anchored into the removable pad. They must not pull out of the pad and they must not rip the interior or exterior of the pad when tightened.

F. Sewing on Pads

1. All stressed seams must be double stitched, at least.

2. Thread with a minimum diameter of .012" and pull strength of at least 14 lbs. must be used.

3. All seams must have at least four stitches per inch. All seams must be tested for strength on the sample pad.

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4. Cloth which has been cut during fabrication of the pad must be treated, coated, or stitched so it will not unravel or fray.

G. Sharp or pointed objects on the removable pad must be shielded to avoid injury to personnel during installation and removal.

H. Each pad must be easily identifiable as to size and pressure rating (ratings) of the equipment which can be covered by the pad. This information must be stenciled onto the removable cover.

I. Wire used to lace the pads together shall be stainless steel with a minimum diameter of 0.025".

J. Required minimum widths on flange and reboiler covers are as follows:

Size of Flange (IN)	Width Required (IN)
3	13
4	13
6	14
8	15
10	15
Greater than 10"	16*

*A width of greater than 16" may be specified.

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