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HW-10735

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August 13, 1948

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Assistant Division Engineer
Redox Design Section

Attention: D. E. Irons/H. W. Huntley

REDOX TEST PLANT - AIR TREATMENT FACILITIES
Ref. Doc. HDC-600 dated 8/3/48

The reference document requested comments and suggestions from the "S" Division on the proposed methods of treating the test plant ventilation air. Based on a study of the postulated treatment methods, the following comments are returned for your consideration.

I. Tank Vent System

It is recognized from past experience with both vented and unvented tank systems in the 200 Areas that the vented system is preferable and should be included in the test plant as outlined in HDC-600. With the increased possibility of moisture entrainment due to this type of system, the installation of adequate cyclone separators may be in order. The provisions for the installation of air treating equipment in the test plant in addition to the proposed sand filter is also desirable from an operating standpoint in the event that the sand filter does not prove to be effective with continued use.

II Ventilation Air Treatment

It is noted from the description of the cell ventilation system that the flow of air through any one cell under normal conditions will be more than sufficient to maintain the exhaust air below the lower explosive limit for a hexone-air mixture resulting from a spill covering the entire cell floor and outside tank surfaces simultaneously. With normal flow of this magnitude through the cells, the need for the automatic dampers activated by hexone vapor sensing instruments would seem to be obviated. Although the exact construction of such a monitoring instrument is not known, it is believed that the installation expense and the maintenance

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and operation of the instrument under special hazards conditions would be such that the value of the automatic damper features to the cell ventilation system would be discounted. It may be more desirable to provide a manually operated damper with which to adjust air flow through the individual process cells. This unit should be designed to open completely in the event of an abnormal pressure rise in the cell and should be provided with an adjustable stop to prevent inadvertent closing of the damper.

The suggestion that the cell dampers be closed during the period of time that the cell blocks are removed has been further clarified by H. W. Huntley. It is our understanding that the closing of the damper proposed under these conditions is visualized more as a throttling of the damper on an open cell to prevent abnormal quantities of air from being drawn through the cell opening with the resulting serious reduction in air flow through the remaining closed cells. It is further understood that, due to the size of the cell, no attempt will be made to maintain an air velocity across the face of the open cell of a magnitude which will absolutely prevent diffusion of activity from the cell. The volume of air required to establish a condition of this nature would be inordinately large. Sufficient air flow through the cell will be maintained at all times, however, to prevent accumulation of explosive mixtures of hexone and air in the cell.

The installation of dampers and connections on the cell ventilating air duct work outside of the building to permit the future connection of a sand filter to the system appears to be very desirable. It should be recognized that as the conditions of particulate contamination now existing in the 200 Areas are corrected, the limit of such activity which will be allowed in the discharge from the process stacks will be set virtually at zero. It is believed, however, that the final decision to install a sand filter on the cell ventilation system in the original construction can be deferred to a later date.

In lieu of more concrete information as to the source and control of particulate contamination in the existing buildings, the proposal for a double stack (i.e. a cell ventilation air stack and an accompanying tank vent and dissolver off gas discharge line to the same height) seems to be a logical approach to the problem. It is suggested in the interest of flexibility that the main stack be designed to discharge the total flow of air from both sources with the low volume system valved to utilize either the auxiliary discharge line or the main stack system. Considering current experience with process building ventilation, it is believed that a smooth non-corrosive lining in the ductwork and stacks would be desirable.

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