Refinery's Slop Handling Simplified by Using Versatile Demulsifier

Problem

A large West Coast refinery was experiencing problems in the treatment of "slop oil", due to the poor performance of the demulsifier used, and the complicated process recommended.

The refinery generated large volumes of slop oil (in excess of 2000 bbls. per day), recovered at API separators and other process waste streams.

The oil was heated to 150-160^{o}F, and the demulsifier was injected while circulating the emulsion for 24 hours. This overmixing, coupled with the addition of excessive amounts of chemical (often exceeding 3000 ppm), created large volumes of reverse emulsion. The mixture of oil and solids stabilized within the aqueous phase analyzed at 60% BS&W.

The previously recommended procedure of extended heating and mixing required continuous operator supervision, gave inconsistent oil recovery, and resulted in high heating costs. The buildup of "rag layer" or unresolved emulsion was reaching serious proportions.

Solution

ECA* 6-3, a blend of reverse demulsifier and polyelectrolyte, was injected during transfer of the aqueous emulsion to a settling tank.

Working closely with refinery personnel, a streamlined operation was designed, whereby natural settling of waste oil streams permitted some dehydration and oil recovery.

The "rag layers" were transferred to one holding tank the subsequently pumped to one of two settling tanks. During the transfer, RECOVEROL* ECO 3NH was injected at a concentration of 300-500 ppm at the discharge side of the transfer pump. ***note: ECO 3NH superseded by ECO 91NG**

Results

Within hours of the addition of ECA 6-3, the aqueous phase showed water and solids separation. After overnight settling, virtually complete oil recovery was achieved.

The oily emulsion layers treated with RECOVEROL ECO 3NH showed immediate water drop. Clean oil was recovered, and water loaded with coke and other fines, was drained off.
There was no evidence of interface buildup after several months of continuous operation.

Although ECO* 3NH was demonstrated to be effective at ambient temperature, refinery personnel maintain a temperature of 130-140^{o}F in the settling tanks to speed up dehydration and minimize the deposition of fines.

Benefits

As a result of the correct application of ECO 3NH, the refinery lists the following as primary advantages of the ECI treatment program:

1. Continuous and consistent recovery of clean oil.

2. Negligible loss of oil in the water phase improves the performance of the wastewater treatment system.

3. Minimum strain on operator schedules, and fewer supervision requirements.

4. Fewer desalter upsets.

5. Reduced fouling in the crude unit preheater.

6. Significantly reduced rate of "mud" buildup in the settling tanks. Mud was non-sludgeing and pumpable.

**Trademark of Emulsions Control, Inc.*

Emulsions Control Inc. 2300 Tidelands Ave National City, CA 91950; Tel (619) 656-8899; Fax (619) 477-7147