

Cathode Nodule Catcher

Xstrata Copper – Copper Refinery

The Problem or Initiative

Cathodes are washed in the wash station of the Cathode Stripping Machine prior to being stripped. This process removes electrolyte and wax remaining from the refining process and often causes nodules of copper to fall on the floor of the chamber. The wash station is required to be cleaned of foreign materials, such as wax, scale and copper debris at the completion of the weekly stripping cycle to prevent build up (Photo 1).

Many of the tasks performed during the cleaning process involve manual handling activities in cramped areas (Photo 2). Prior to the change, workers were first required to remove three false floor plates which weigh approximately 32kg each, and then shovel up the tramp copper and wax from the floor into buckets. The buckets were then carried to the front of the wash station to be emptied into bins. Approximately 250 kg was shovelled in total, taking up to an hour and a half. In addition to the manual handling risks associated with the task, the internal area is still quite warm and humid due to the wash water temperature being maintained at 85°C, and only a window of time is available to complete the job.

Solution

A system has been installed that virtually cleans itself by gravity (Photo 4). The false floor plates have been removed and a nodule catcher has been installed. This means that all the copper waste ends up in the nodule catcher (Photo 5), which is emptied bi-weekly with out any issues (photo 6). The requirement to enter the wash station to remove wax build up has reduced due to an increase in temperature and pressure in the system.

Benefits/Effects

This innovation has provided a cleaner system and has reduced the requirement to enter the wash station from weekly for up to an hour and a half, to once every 2 months for approximately 5 minutes. The manual handling risks have therefore reduced significantly, along with the risks associated with working in hot conditions.

Transferability

The system could be easily installed in other refineries, or the concept installed in processing plants where similar cleaning and maintenance issues exist.



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5