The Luilu plant at Kolwezi, Democratic Republic of Congo, has been operating since the late 1950s, but fell into considerable disrepair and disuse during the past two decades due to lack of investment in the war-torn country. In 2008, Glencore subsidiary Katanga Mining assumed control of the operations and, since then, has invested considerably in refurbishment and upgrading of the processing plants in an effort to achieve world-class production capabilities. One such initiative involves improving the quality of the cobalt cathode.

Copper and zinc are two of the main impurities reporting to the cobalt metal product, as these elements are incompletely removed from the electrolyte in the upstream precipitation processes. Ion-exchange technology was investigated to remove these impurities from the cobalt advance electrolyte.

Laboratory testwork identified a suitable ion-exchange system. An on-site pilot-plant trial, treating 1500-3000 L/d of electrolyte, was then operated for a period of six weeks to optimise the selected operating conditions and to determine full-scale design criteria. Copper removal was carried out using a fixed-bed lead-polish configuration with the Lanxess aminodiacetic acid resin, TP 207. Zinc removal was subsequently carried out in a similar configuration using the Lanxess aminophosphonic acid resin, TP 260. The optimised system proved capable of consistently removing both copper and zinc to <1 mg/L. Selective elution allows co-loaded cobalt to be returned to the main circuit. The process shows operational and economic advantages over the traditional flowsheet, and full-scale implementation is in progress.