

## REDUCTION OF PRODUCT LOSS IN DRYERS

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In one of the soda ash production facility, there was significant quantity of product loss in the drying process. The product was spilling from the inlet flanges of the rotary dryers. The target was to minimise the loss of product so as to enhance the production by minimising the down time of the dryers.

In centrifuge-drying operation the sodium carbonate crystals produced in evaporators are dried and converted in to refined anhydrous sodium carbonate. Material feed mechanism to the steam tube rotary dryer is through feed screw and feed to the dryer is wet Sodium Carbonate. Existing seal design is single leaf seal between Rotary Dryer shell and stationary housing.

There were many problems leading to the production loss due to spills, leaks, dusting etc. the major one was - Leak from the dryer inlet seals.

The present installation of screw feeder in the Drying sections is inclined upwards towards inlet and the dryer is inclined towards discharge. Due to such an orientation of the feeder, the overlapped leaves of the existing sealing system are undergoing non-uniform rubbing against the Rotary dryer. The spring leaves are also subjected to variable stress pattern while their free ends rub against the Rotary dryer. This phenomenon was leading to fatigue of the leaves and finally the leaves were getting damaged. This arrangement had increased the clearance between leaves and the rotary drum leading to excessive product leakage.

It was observed that many of the springs leaves of the existing sealing system were found damaged at their ends due to rubbing against the rotating shell of the dryers.

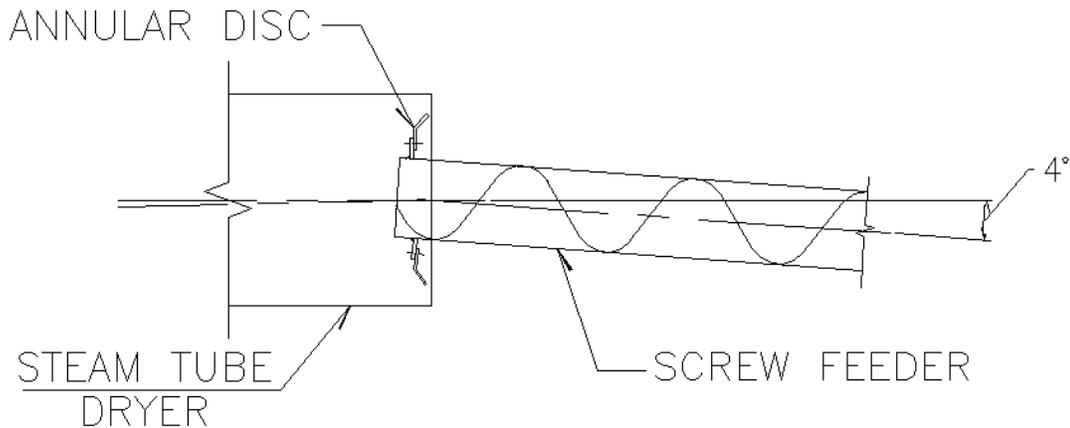


A core team of experts reviewed all the inputs collected during the site visit by TCE team, construction details of the dryers. Detailed root cause analysis was carried out by TCE regarding product loss through dryer seals.

It was concluded that some material was flowing back towards the inlet of the dryer and was building up near the inlet causing the leakage. Various alternatives including long term and short term solutions to arrest the leakage of product from dryer seals were worked out.

As part of short term remedy, to prevent material built up at the sealing surfaces, an additional disc around the screw trough, as detailed in the sketch below was proposed.

This disc will act as the baffle plate and will restrict the material carry over towards the inlet seal.



This solution is cost effective, simple and quick to execute without any major down time of the dryer and minimise the production loss due to non-availability of driers. It was suggested to carry out the modification during the routine maintenance of the dryers and TCE carried out necessary engineering including fabrication drawings of the disc and the sequence of installation.

As part of long term solution TCE did an exhaustive analysis of the problem and after evaluating each of the probable solutions, suggested a couple of solutions to ensure better sealing systems to be retrofitted by replacing the existing sealing system at the dryer inlet and outlet.

TCE also carried out an extensive study and identified various locations of product loss in the entire soda ash handling system and suggested modifications in order to minimise dust generation, avoid material build-up, spillage etc.

Such unique, customised solutions demonstrate TCE's in-house capability of providing cost effective, fit for the purpose and easy to retrofit solutions for industrial plants.