The vapor is usually pumped to the down distillation column located below flash zone (i.e. below the reign where the crude oil enters). The aim of pumping the vapor is 1- Remove the remaining gas oil from reduced crude (un-vaporized) 2- Reduce the partial pressure leading to boiling the compounds at low temp. The water vapor or the steam is pumped due to the following reasons: 1) Available 2) Cheap 3) Don't mix with crude oil 4) Good heat transportation The steam quantity is calculated by using the following equation: t s t s p p n n ns: is the no. of moles of vap. nt : is the total moles ps: is vap. press. pt: is the total press. t t n s t s t n p p p n n p p p ( ) pn: is the press. of H.C Ex: Estimate the no. of moles of steam required to add to the distillation column to reduce the boiling temperature from 400 to 350F. Sol.: 400 at 760mmHg From Fig. 17, (by connection 350 with 400F) so pn=400mmHg Let nt =100 mol n moles s 47.38 760 (760 400) 100 Reflux and Reflux Ratio Reflux is the ratio between the amounts of material that returned to the distillation column to the material that result at distillation. In order to increase the degree of separation and high purity, amount of liquid is returned to the column in addition to getting rid of heat making the column in thermal equilibrium case.