

I will discuss such models a little more fully in a few minutes.

System models may be employed with regard to a number of objectives. They are generally used to test the implications of changes in a system, and to give us an estimate of the significance of each component with respect to total system operation. The process of constructing a model will, in itself, tend to give one a better overall understanding of the system and how it functions. Information provided by the model can then be used in the design or improvement of the system. It should be noted that model analysis, unlike real system experimentation, can be applied to proposed future systems as well as to those that already exist.

The better overall understanding of system operation provided by a well-constructed model, can also be of great assistance to the manager in designing his management information and control mechanism, and in the development of improved operating policies and procedures. Finally, a bonus effect of many good models has been their value in the training of operating personnel. To illustrate the remarks I've just made, let us consider a model that was developed and used successfully in connection with the water resource management program on the upper Nile.

This slide is a little old; it's about worn out. The Upper Nile System begins at the Aswan Dam in Egypt and includes the main rivers; their dams, reservoirs and tributaries, and the Uganda Lakes. The general objective of water management is for irrigation, power generation, flood control, minimization of evaporation losses, and provision of an adequate flow to the lower Nile. There is a requirement to collect and store enough water during rainy years to carry through a drought cycle. There are also special restrictions on the maximum and minimum permissible water levels in lakes. Evaporation losses can be serious, and must be minimized by keeping water as long as possible in remote mountain reservoirs and lakes. And this increases the complexity of the control problem; for, in order to make a change at