

Load shedding has been used as an emergency operation procedure by members of the Florida group for a great many years. Underfrequency relays have been used to automatically shed load on the systems of Florida Power & Light Company and the City of Jacksonville for nearly ten years. There have been a number of cases where these relays have shed load to achieve a match between generating capability and load, and thereby halt a potential cascading situation. More than one million kw of load can be shed by underfrequency relays under peak conditions on the Florida Power & Light Company system. Similarly, the City of Jacksonville can shed about 150,000 kw. Since the five systems are strongly tied together, this protection has been available to all five members as a second or third contingency backup. We are informed that the other three group members are individually proceeding with studies and evaluations for such installations, and it is expected that the several systems will soon have in operation internal load shedding capability of about 1,500,000 kw.

Spinning reserves in the five Florida systems are constantly studied and re-assigned and increased in amount as larger generators are installed, and as the load on the five systems increases. It should be repeated that spinning reserve is most important in assuring continuity of service, and we are very proud of the fact that the Florida operating group has for a long time focused attention on this subject to be sure that sufficient reserves are instantaneously available. This item is covered in more detail under Question 8.

3. Any studies you have made relative to the ability of your system to continue to function upon the sudden impact of uncontrolled energy into the system of the magnitude of the combined output of your three largest generating units.

Study indicates that it would be impossible for the Florida Power & Light Company system to be affected as was the Northeast, by a surge of uncontrolled power on the order of magnitude of our three largest units. Florida Power & Light Company tie lines would trip by relay action, and the Florida Power & Light Company system would continue to operate. Florida Power & Light Company provides adequate generation on its own system and, therefore, is not dependent on remote generation over long transmission lines through neighboring systems.

4. Any studies you have made on the possible weaknesses of concentrating generation in single stations of the magnitude of 2, 3, 4, 5, and 6 million kilowatts.

Present total capability of Florida Power & Light Company is about 3700 mw with another 2400 mw being engineered and constructed. We do not concentrate all our generation in any particular area, and now have nine power plants in our several load areas ranging in size up to 1300 mw. The maximum desirable size of a plant depends on many factors, among them being system and area growth.

We continually make computer load flow studies to determine the effect of outages of generators, lines and substations, and take necessary steps to insure that there will be no adverse effects. Each generating unit is designed so that its loss will not have any significant effect on other generating units within the plant. Each plant is designed so that there are sufficient transmission lines to provide firm transmission capacity. All principal lines are terminated in substations with double busses, using a double breaker or a breaker-and-a-half design.

In the unlikely event of a serious power failure, such as the loss of our largest plant, and in the event that the remaining available reserves both on our system and other Florida systems are inadequate, our underfrequency relays will operate to match load to the capability of the remaining generation and thus avoid a systemwide failure.

5. Any studies you have made on the optimum limit on interconnections.

The optimum limit of an interconnection (meaning a group of interconnected systems) depends on factors such as geographic layout and distances, and on the number of people and systems involved. An interconnection may tend to become unmanageable in some respects if too great an area and too many people are involved.

The optimum limit of interconnections (meaning ties) is determined by the purposes and costs of the interconnections and the economics of alternate plans, such as for local or area generation. Generally interconnections must grow with the systems involved. Size of generating units to be backed up or protected, distances and exposure to natural hazards, such as hurricanes and severe lightning, must all be considered in the plans for interconnection and the determination of optimum sizes.

6. In what ways your individual system of interconnection or pool has protected itself against similar occurrences.