

Hurricane and Flood—September 1938

By W. H. HARRISON

Editor's note: The following was presented by Mr. Harrison as the closing address of a symposium on the effects of the hurricane and floods of September 21, 1938 on transportation, power and communication utilities. The symposium was held in New York at the Winter Convention of the American Institute of Electrical Engineers, Thursday, January 26, 1939. After the close of the meeting a motion picture on the hurricane prepared by the Bell System for the information of its own employees was shown.

THE experiences of the telephone companies are naturally much the same as those already described. The aftermath tally showed that more than one-half million telephones were put out of service—in the New England States about thirty per cent of the telephones in that area. Through the destruction of toll lines, the storm temporarily cut off telephone communication with the outside from over two hundred towns. The total damage to telephone plant was in the neighborhood of ten million dollars.

The story of restoration—the immediate provision of emergency services—the handling of emergency supplies in unprecedented quantities—the augmenting of forces locally to supplement the normal forces—and the mobilization of forces from other areas—all are replete with engineering interest and are very intriguing, but it would not be appropriate to take the time to tell the story here. A few facts will give you a sketchy idea of the situation.

As to materials:

3,500,000 feet of lead covered cable
54,000,000 feet of paired wire
7,000,000 feet of steel strand for guys
and supporting cables

As to mobilization of forces:

Local construction forces were expanded from 3,000 to 5,000. In addition, 2400 highly skilled linemen, cable splicers and installers and over 600 fully equipped construction trucks and other special motor

vehicles were brought from fourteen other telephone companies as far south as Virginia and as far west as Nebraska and Arkansas.

Of striking significance in the prompt restoration of service was the traditional Bell System background of standardization of materials and methods. This standardization greatly facilitated the collection of large quantities of suitable supplies and made possible maximum effectiveness of the men who came from many parts of the country. The striking effectiveness of these measures is a great tribute to the engineers who long ago by their recognition of the value of standardization laid the broad foundation for this effective work.

In every disaster much is learned with regard to formulating plans and caring for specific situations. Of interest in this specific situation, there had been serious floods in much of this territory in 1936. The experience at that time pointed to certain precautionary measures and we know of no case where these did not prove effective in the present situation. For example, while the water rose five feet above the ground floor level of the main telephone building in Hartford, it was successfully kept out of the building by bulk-heads about the doors and windows, provided since the 1936 flood. Also, at various places where lines had been carried away due to the failure of bridges or other forms of river crossings the restored lines did not fail.

Over and above all of these more or less specific points, which I might say are somewhat routine, lies a broad engineering fundamental vividly illustrated by this whole experience.

Engineers by their work have made a pattern of life which has come to make individuals and communities dependent to a large extent in their day-to-day activities and mode of living, on the proper functioning of the services of power, transportation and communication.

Having done this, they have seen their works fall before the fury of nature—have seen the utter disruption of the organized scheme of life, with all the anguish that goes with such disruption.

It is in the light of this experience that an engineering fundamental of first magnitude presents itself, and one which offers a long range problem that is going to call for nicely balanced judgment, both on the part of the engineer and the management. This fundamental stands out clearly—dependability of service, and specifically the degree to which dependability can soundly and wisely be built into the physical plant.

It is trite to say that dependability is fundamental to good service, that it is of prime consideration in the design, construction and operation of all communication, power and transportation facilities. On the other

hand, it would be foolhardy to assume that any man-made structure could completely withstand the fury of the elements, as typified by this storm.

Consider the circumstances. For four days rain was progressively heavier. It totaled between five and ten inches at many New England points. At some places more than six inches of rain fell in one day. As a result large rivers were brought to flood stage and small brooks and streams became raging destructive torrents. And then came the hurricane—then the seas. Wind velocities as high as from 120 to 180 miles per hour have been reported. Raging flood and tidal waters inundated important sections of many communities. Our services extended over the entire band of the storm and we can definitely trace the relationship of high wind velocities and resultant damage.

Another important circumstance, and bearing particularly on engineering consideration, is that nothing like this had happened in this area since the year 1815.

Obviously, to build plant to be unyielding to the sea and to be hurricane tight against such occurrences at century intervals would be as unsound as to ignore them altogether. Thus a challenge is presented to the engineer, taxing his best judgment. On the one hand, not failing to take every reasonable precaution in the future design of the plant, such as the avoidance of known exposures, the provision of alternate routes, the use of emergency restoration facilities of every conceivable character, adequate emergency operating routines; and on the other hand, not to be led by the tragedy of the storm to recommend extreme construction and operating procedures such as wholesale substitution of underground for aerial plant, which would obviously not be in the public interest.

This, it seems to me, is the broad lesson that we draw from this experience and the challenge presented to the engineer.

It was my good fortune to have been in the midst of the restoration work. It was comforting and inspiring to see how the men and women of all service agencies responded to the call, each presented with a trying problem of his own but ever ready to lend helpful and effective cooperation to those in other utilities, and all motivated with the common objective of maximum service to the community in this period of great distress. I know we in the telephone end could not have done our job had we not had the help of others, including the highway and other public agencies.

The final measure of any man's work is, has it been for mankind? A grateful public has put the mark of approval on the work of the men

and women of the utilities and transportation groups in the stricken area. My admiration for them knows no bounds. Frequently when we fail of expression we turn to the pens of immortals.

Two lines in one of Kipling's poems—"Sons of Martha"—beautifully express the work of these men and women:

"Not as a ladder from earth to Heaven, not as a
witness to any creed,
But simple service simply given to his own kind
in their common need."