

**NAME OF SYSTEM:**

**Automated Merchant Vessel Report  
(AMVER)**

**ORIGINATOR:**

**Eastern Area, U.S. Coast Guard  
Custom House, New York City,  
New York 10004**

**OBJECTIVE.** To improve coordination and rescue operations at sea by being able to rapidly store, retrieve, and communicate essential data concerning the locations and capabilities of ships that may be called upon to render emergency assistance to those in distress.

**BACKGROUND.** Two of the many functions and activities of the Coast Guard are conducting search and rescue operations and assisting vessels and aircraft in distress. In performance of these responsibilities the Coast Guard for many years manually maintained a plotting chart of Eastern coastal waters for those ships for which agents submitted itineraries. Positions taken from weather reports were used to increase the accuracy of vessel plotting. Where regular Coast Guard forces were not adequate, appropriate merchant ships were asked to provide assistance during search and rescue (SAR) operations. The density of ships in the area and the size of the plotted area were small, but the potential for an enlarged mutual assistance program was readily apparent.

When a relatively low cost computer with a random-access disk memory file capability became available, the time seemed feasible to automate the plotting activity and to evaluate the SAR potential for assisting a larger number of ships. Electronic data processing equipment was installed and the AMVER System was established in July 1958. The number of ships plotted and the accuracy of their dead reckoning positions were increased by use of radio stations to relay sail plans from the ships to the Ship Plot Center. These radio sail plans included departure place and time, routing, destination, and average speed of ship advance.

During the next few years both the participation and scope of plot area increased. As a result of the success of the system, an updated electronic data processing system was placed in operation in a new AMVER Center in the New York Custom House in December 1964.

**THE NEW METHOD.** The AMVER System consists of a network of designated radio stations, Rescue Coordinating Centers (RCC), the AMVER Center, U.S. Ocean Station vessels, and participating merchant ships. Inputs to the system are usually messages received directly in the AMVER Center on teleprinter equipment. This information covers such things as sail plans, position reports, deviation reports, and arrival reports. The information is placed in properly coded format, punched into tabulating cards, verified for accuracy, and entered into the computer for processing, storage, and possible future use. Based on proper programs, the computer generates a special sail plan for each participating ship, or corrects one already on plot, and stores the results on magnetic memory disks ready for use in an emergency. New positions are calculated for each ship at intervals of 12 hours.

When an emergency occurs, the information retrieval capabilities of the system react with great speed. First, the controlling Rescue Coordinating Center requests a Surface Picture (SURPIC) from the AMVER Center using the same teletype network. Within two minutes, the programmed computer prints out a SURPIC listing of the appropriate vessels on plot in the specified area to include their predicted positions and rescue capabilities. Simultaneously a punched card is prepared for each ship identified by the computer. The cards are placed in special data transmission equipment that sends the SURPIC by teletype to the requesting Rescue Coordinating Center for use with other available information.

With reference to the SURPIC's, the Rescue Coordinating Center in its initial notice specifies the parameters of the emergency. These factors include the date and time to the nearest hour, the geographical area, and

the category of ships involved. The areas of search may be a circle defined by a center point and radius of any number of nautical miles; a rectangle whose sides are specified parallels of latitude, and meridians of longitude; or a path of any width along the track of a ship or aircraft. The request will usually specify whether the message is for all ships on plot or only for those with a doctor on board.

The contents of the retrieval answer from the AMVER Center will include the ship's name and international call sign; predicted position and time of arrival thereat; course, speed, and radio watch schedule; availability of a doctor, radar, and radio telephone; and estimated time of arrival at destination.

**REMARKS.** The AMVER System is an excellent example of the use of modern electronic and computer technology to improve service. The computer's instant reaction to preset mathematical programs concerning ship positions is illustrative of the system's information search capability.

The computer's magnetic memory contains a list of more than 17,000 ships along with their search and rescue characteristics. Three thousand different vessels are plotted each month on 6,000 separate passages. During each month in the North Atlantic maritime region about 100 requests for Surface Pictures are acted upon by the system in resolving actual or potential emergencies.

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