

Current Comment

S. G. HERSHEY, M.D., *Editor*

Fire Hazard in the Operating Room

ALVIN WALD, B.E.E., M.E.E.,* AND VALENTINO D. B. MAZZIA, M.D.†

Often, during surgical procedures, direct recordings of physiological parameters are desired. Recently, a hazardous condition developed when using a particular type of recorder.

One popular type of direct writer uses a wire stylus, heated by an electric current, which makes contact with a wax coated, heat sensitive paper. The temperature of the stylus determines the intensity of the inscribed record. This is controlled manually to suit the particular circumstances. In addition, there is an automatic control which increases the stylus temperature when a faster paper speed is selected. This feature maintains a constant intensity of the record, independent of the chosen paper speed. With the particular recorder used, at the maximum paper speed of 50 mm./second, the stylus will glow an orange-red during normal operation. This color corresponds to a temperature in the order of 4,500° K. Because of the exposed hot wire and the overall nonexplosion proof construction, this type of direct writer cannot be used in an explosive atmosphere. Instruments of this type include the Beckman Dynograph, Sargent SR, Sanborn, and Texas Instrument Oscilloriter.

The hazardous condition encountered occurred during an operative procedure while using such a writer, the Sanborn Model 322 two channel recorder. At a certain point it was desired to examine a portion of the record. A plastic cover plate protecting the styli

and paper was lifted. The styli were removed from contact with the recording paper by raising them from below with a metal stand-off. The paper speed was increased to the maximum of 50 mm./second in order to make the desired portion of the record more quickly available for inspection. It was at this moment that the paper drive mechanism jammed. While trying to clear the fault a torn edge of the paper came in contact with the incandescent filament and ignited. The exposed portion of paper burned vigorously for several seconds until extinguished by smothering. The overall area of the paper burnt was approximately 6 inches \times 2 inches. A non-flammable anesthetic agent (halothane) was being administered, and there was no danger of an explosion. However, the mere presence of an open, potentially uncontrollable, flame in the operating room, where oxygen and flammable materials are present, is a potentially dangerous situation.

If a heated stylus type of direct writer is used during operative procedures special care must be taken to prevent contact of flammable materials with the incandescent stylus. Special attention must be given to assure that the recorder paper runs smoothly at all paper speeds. If the paper drive mechanism does require manual adjustment, *the writer should first be turned off.*

Recorders which do not operate on the heated stylus principal include Grass and Beckman ink writers, and photographic types such as the Honeywell Visicorder, the Consolidated Datagraph, Sanborn, and Brush Instruments.

* Electronics Engineer in Charge of Monitoring, Department of Anesthesiology, University Hospital, New York, New York.

† Director, Department of Anesthesiology, University Hospital, New York, New York.