UNITED STATES
DEPARTMENT OF THE INTERIOR
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TO MEMBERS OF THE HEALTH AND SAFETY BRANCH:

SUBJECT: Five injured (two fatally) by a local methane explosion in a quicksilver mine near Williams, California.

A local methane explosion on the 400-foot level of the Abbot mine, International Metals Development, Inc., about 25 miles west of Williams, California, on May 6, 1946, resulted in the hospitalization of 5 workmen for injuries and burns, two of which died later. It was the belief of those that investigated the explosion that the gas was ignited by a lighted match while attempting to light a cigarette; score again for the allowing of smoking in a mine.

The mine produces cinnabar and, during the war, was an important producer of quicksilver and at times employed 40 to 50 men, but the ore bodies have been depleted and only one exploratory drift is being driven on the 400-foot level. At the time of the explosion only 10 men were employed underground and 5 on the surface.

The mine is opened by a three-compartment shaft and by two adits on the 200-foot level which extend to the surface. The shaft is 480 feet deep with levels at intervals of approximately 100 feet below the 200-foot level. The old workings are extensive and reach from the 500 to the 200 level.

The mine is not mechanically ventilated except that the natural movement of air is augmented by a 12-inch blower fan at the 200 level with metal tubing extending down the shaft to the lower levels. Before the explosion most of the air from the blower was directed into the 400-foot level where increased ventilation was required.

In order to increase the air movement in the 401 drift which was approximately 1,300 feet from the shaft, a 10-inch blower was installed in the drift about 250 feet from the shaft and operated as a booster in the tubing from the 200-foot level. From this 10-inch fan, 10-inch metal tubing was extended for about 700 feet to a second booster and an 8-inch blower installed with 8-inch metal tubing extending to the face. This arrangement of the blower fans did not provide sufficient ventilation at the face, and on the day of the explosion the arrangement of fans was being changed. The 10-inch fan was moved about 450 feet nearer to the face and 10-inch metal tubing was to be extended to the face, thus eliminating the 8-inch blower and the 8-inch tubing.

On the morning of the explosion the 10-inch fan was moved and installed at its new position and put into operation about 9:30 a.m., at which time the 8-inch fan was disconnected from the power line. Also at about the same time the metal tubing was disconnected about 20 feet inby the 10-inch fan to permit timbering a section of the drift. As a result of disconnection of the tubing, the face and about 516 feet of the drift were not being ventilated from 9:30 a.m. to the time of the explosion.

Traces of gas had previously been detected in this mine but never in concentrations high enough to present an ignition hazard; however, other quicksilver mines in this area have encountered inrushes of methane and the Reed mine, located about 10 miles away and having similar rock formations, has had three gas ignitions since December 1941.

On April 29 a fault was intersected at the face of the 401 drift, and several days later a fall occurred followed by an inrush of water which flooded the pump on the 500-foot level. After the water was lowered the mine foreman and workmen inspected the workings on the 400 foot level, and as the foreman struck a match to light a cigarette he saw a cap of considerable height above the flame of the match. The match was quickly extinguished and the incident recognized as an indication of the presence of gas.

On the day of the explosion the underground employees left the mine for lunch shortly after 11:30 a.m. and returned about 1:00 p.m. At the time of the explosion 3 men were installing metal tubing to by-pass the 8-inch fan and repairing drift timber; two others were cleaning a fall preparatory to setting timber at the point where the 10-inch tubing had been disconnected near the 10-inch blower while the foreman was at the 10-inch fan. The three man crew closest to the face were at work for only about 5 minutes after lunch when the explosion occurred. These three men were burned and severely injured but were able to walk to a place where other employees assisted them from the mine. The two men near the fan were burned and thrown to the floor, one of them being caught under a small fall from which he was quickly extracted by his partner, and they were both able to leave the mine. The concussion from the explosion threw the mine foreman about 15 feet along the drift but he was uninjured. The injured men were taken to a hospital 37 miles away where two of those that had been working closest to the face died.

The drift inby the fan was cleared of gas by adding lengths of tubing and starting and stopping the fans from the surface when no one was in the mine.

The investigators concluded that the most likely cause of the ignition was the lighting of a match by one or more men of the three-man crew installing tubing; two of the men were habitual smokers.

The California Industrial Accident Commission issued 16 written requirements to the company, pertaining mostly to the testing of gas and precautionary measures for working where gas might be encountered and ordered the stopping of smoking underground or the carrying of smoking materials, matches, etc., underground.

COMMENTS: The above incident well illustrates that the lack of adequate ventilation and lack of precautionary measures in the presence of explosive gas are likely to be fully as hazardous in a non-coal mine as in a coal mine, and essentially the same precautions are required. The use of fan-tubing systems of ventilation and the allowing of smoking are both hazardous in any mine known to be likely to encounter explosive gas.

This memorandum is based on a letter report of the explosion by J. Howard Bird, engineer-in-charge, Berkeley Station,

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APPROVED:

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