

FOAM AND GEL DECONTAMINATION TECHNIQUES (U)

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INTRODUCTION AND SUMMARY

The Savannah River Site is investigating decontamination technology to improve current decontamination techniques, and thereby reduce radiation exposure to plant personnel, reduce uptake of radioactive material, and improve safety during decontamination and decommissioning activities. When decontamination chemicals are applied as foam and gels, the contact time and cleaning ability of the chemical increases. Foam and gel applicators apply foam or gel that adheres to the surface being decontaminated for periods ranging from fifteen minutes (foam) to infinite contact (gel).

This equipment was started up in a cold environment on June 8 and 9, 1989. The desired foam and gel consistency was achieved, operators were trained in its proper maintenance and operation, and the foam and gel were applied to walls, ceilings, and hard to reach surfaces.

HIGHLIGHTS

The applicators were safety inspected before the startup on June 8, 1989, and the desired consistency of foam and gel was achieved by adjusting the appropriate regulating valves. Foam and gel were applied to a fork lift, vessels, and piping to demonstrate the ability to cling to surfaces. The foam adhered to the surface for a short period of time and then began to run off. However the gel adhered to the surface, did not run off, and was removed by water.

We were concerned with the disposal of the foam and gel because foaming will cause problems in the waste tanks. A defoamer (ISM-25A) was used to kill the foam before disposal to the waste tanks. After dilution, the waste was sent to the waste tanks by steam jetting, and no foaming problems were encountered. The demonstration was a success, and it is expected that this technology will be used to decontaminate various facilities located throughout the Savannah River Site.

PROGRAM

- SRL will conduct small-scale tests to compare the decontaminability of straight chemicals with chemicals applied as foam and gel.
- SRL will compare how the removal of the foam and gel affects the decontamination factor (i.e., is water rinsing, removing with a vacuum, or removing with the Kelly spray/vacuum more efficient).
- The technology will be coupled with the Kelly System to decontaminate rooms of the old HB-Line at the Savannah River Site.
- The technology will be used to decontaminate pumps and other equipment in building 299-H at the Savannah River Site.
- SRL will continue to investigate needs at the Savannah River Site and implement this technology.
- The results of the above tasks will be documented and communicated.

ACKNOWLEDGMENT

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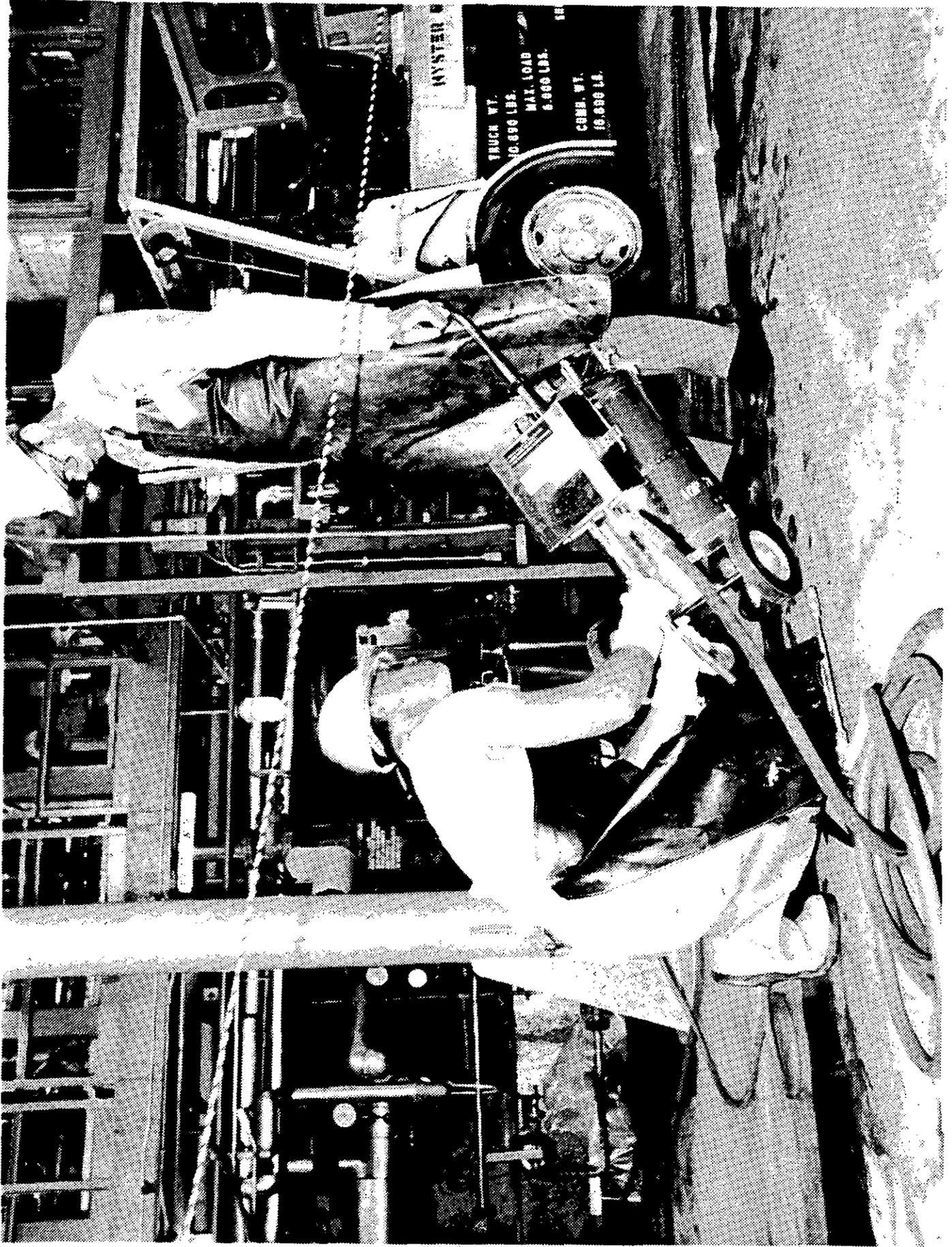


Figure 1. SRS operator and DuBois chemical representative attach the air connection to the Foamall™ "10" foam applicator.

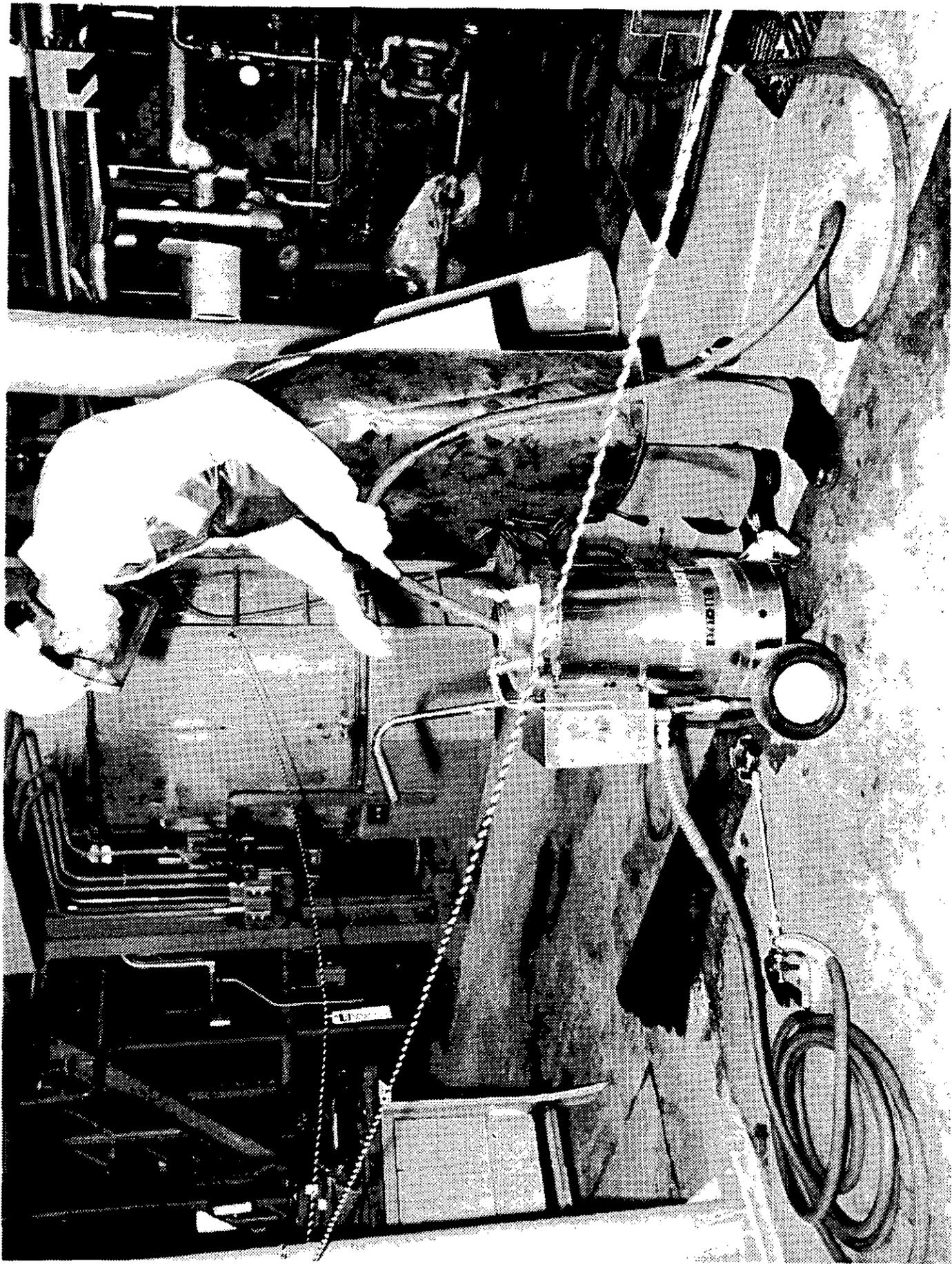


Figure 2. The "Foamall™ "10" is filled with water.

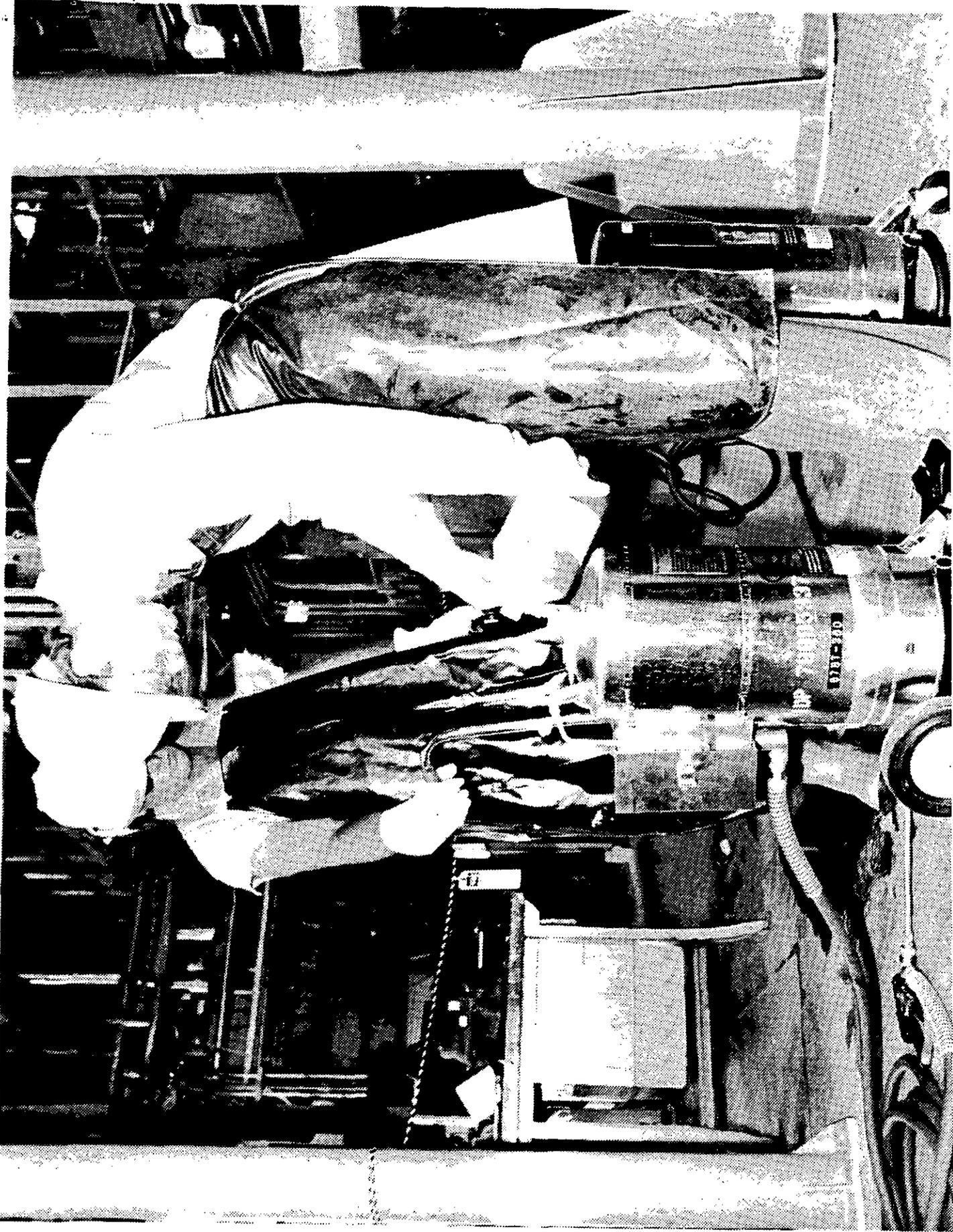


Figure 3. The Foam Add™ is added to the Foamall™ "10" which produces the foaming effects: The decon chemical of choice would also be added during this step.

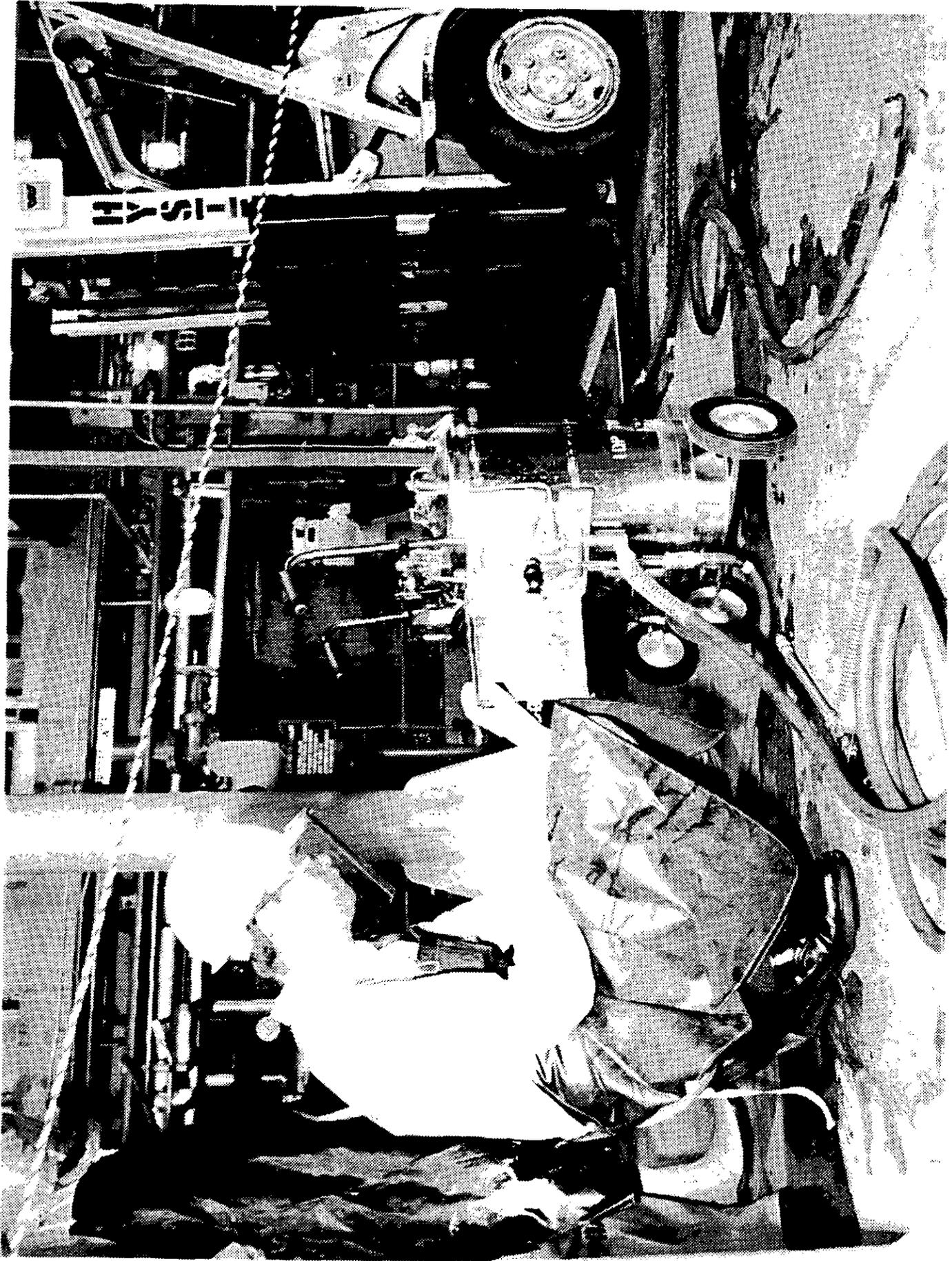


Figure 4. The regulators to produce the desired consistency of foam are adjusted.

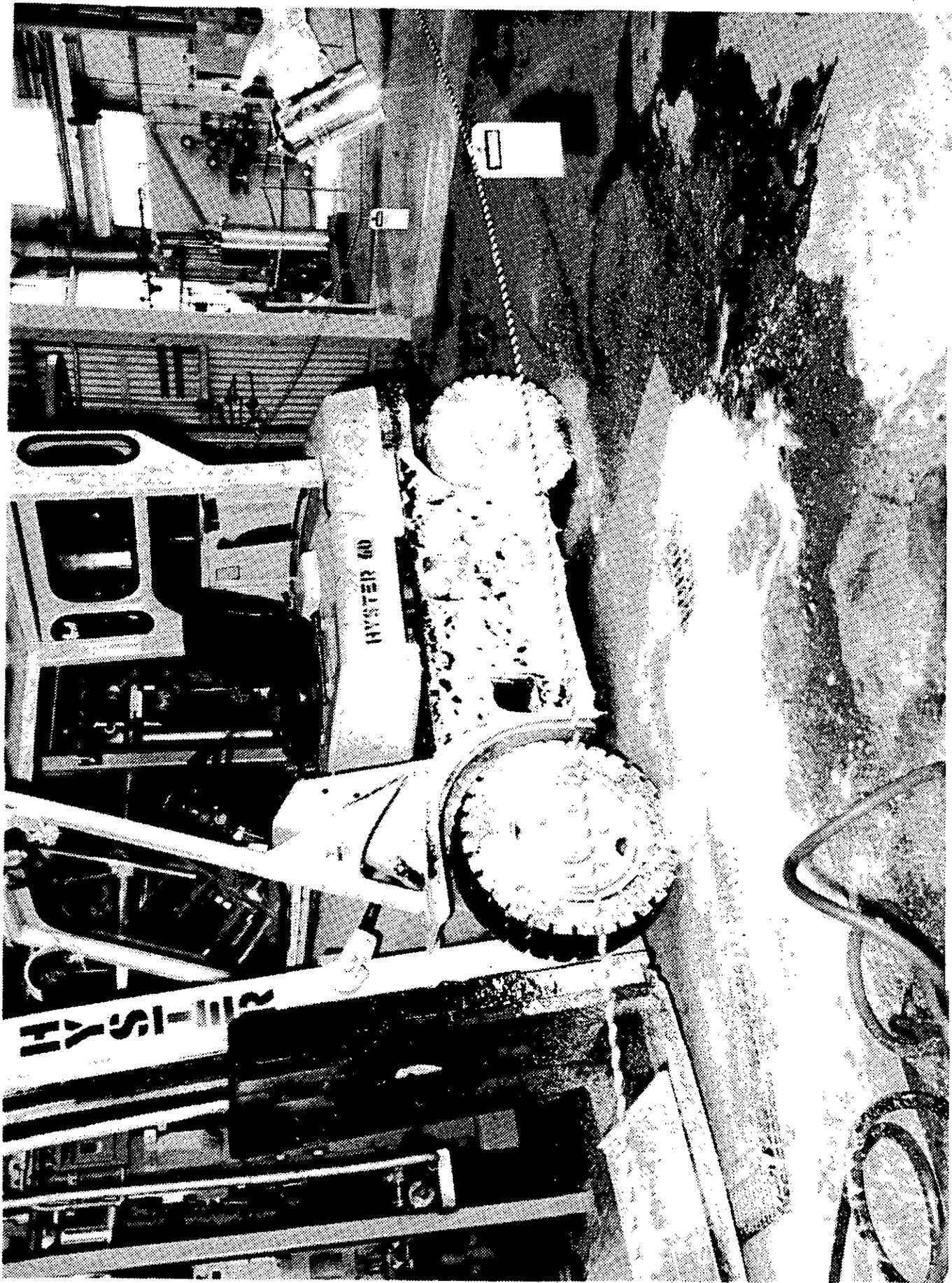


Figure 5. Foam is applied to the forklift.

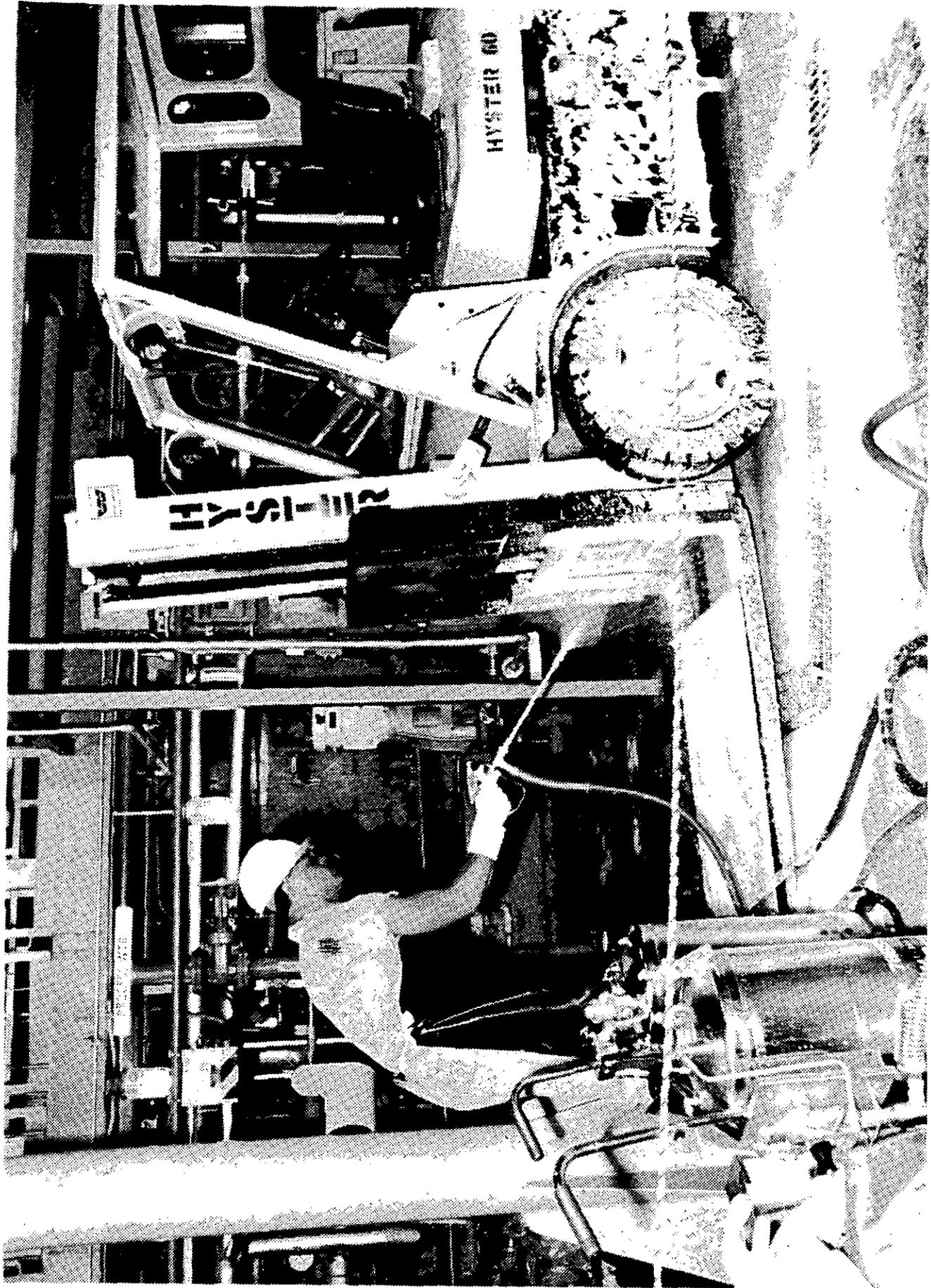


Figure 6. Foam is applied onto the teeth of the forklift.

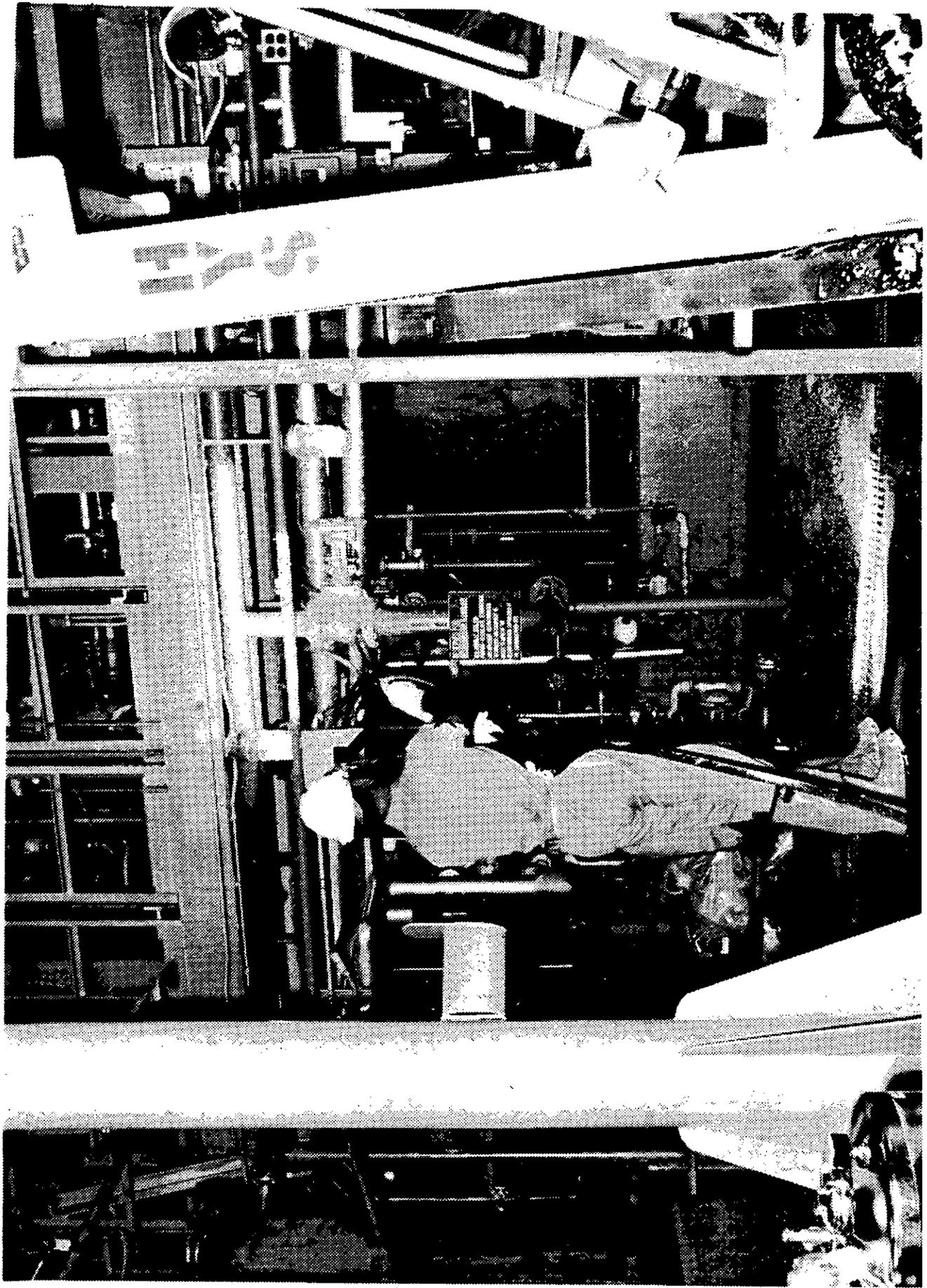


Figure 7. Foam is being applied to piping, demonstrating its ability to cling to raised and rounded surfaces.

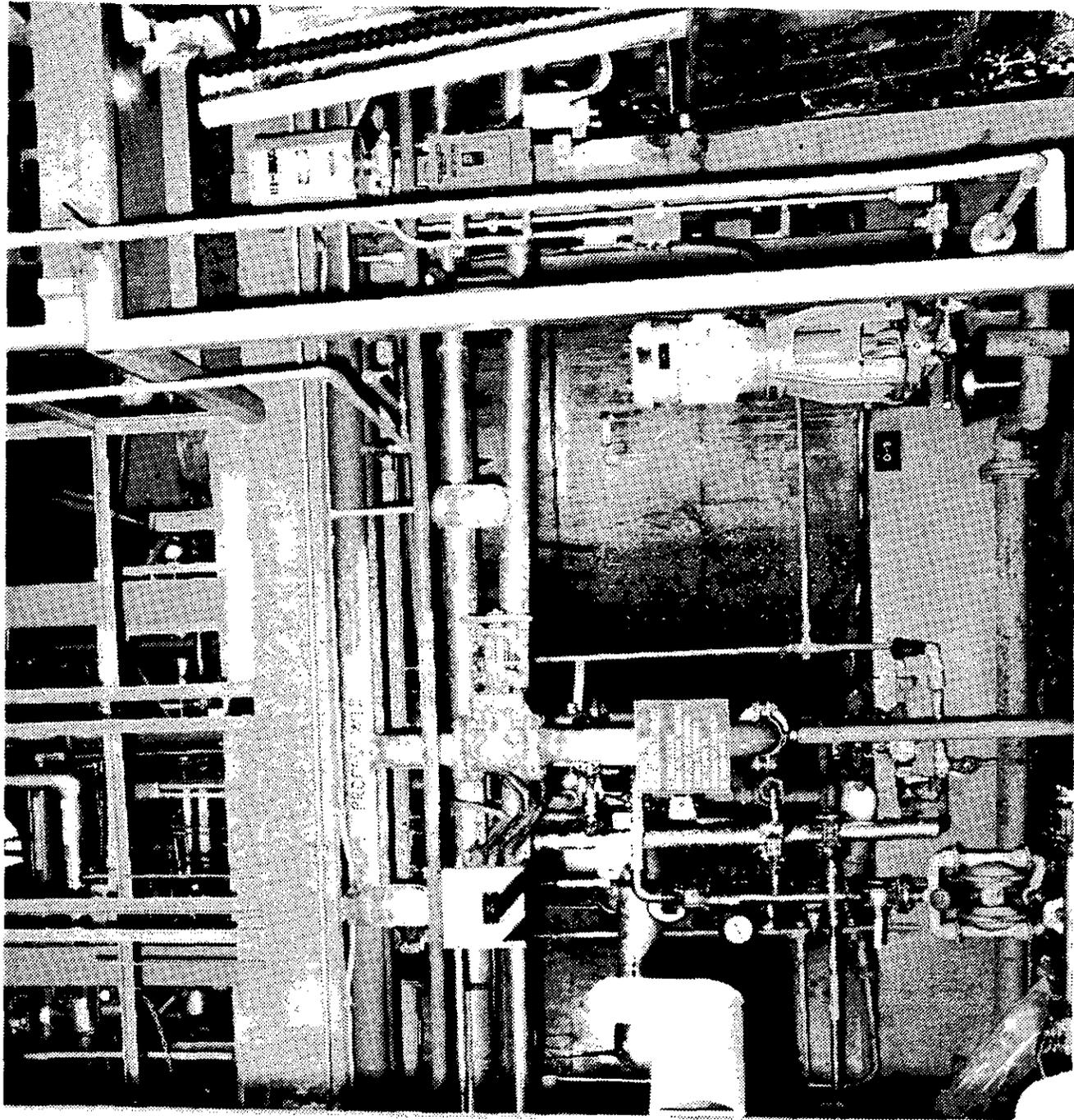


Figure 8. The foam clings to the surface for approximately 10 to 15 minutes and begins to run off.





Figure 9. An SRS operator demonstrates the proper procedure for applying foam onto a ceiling.

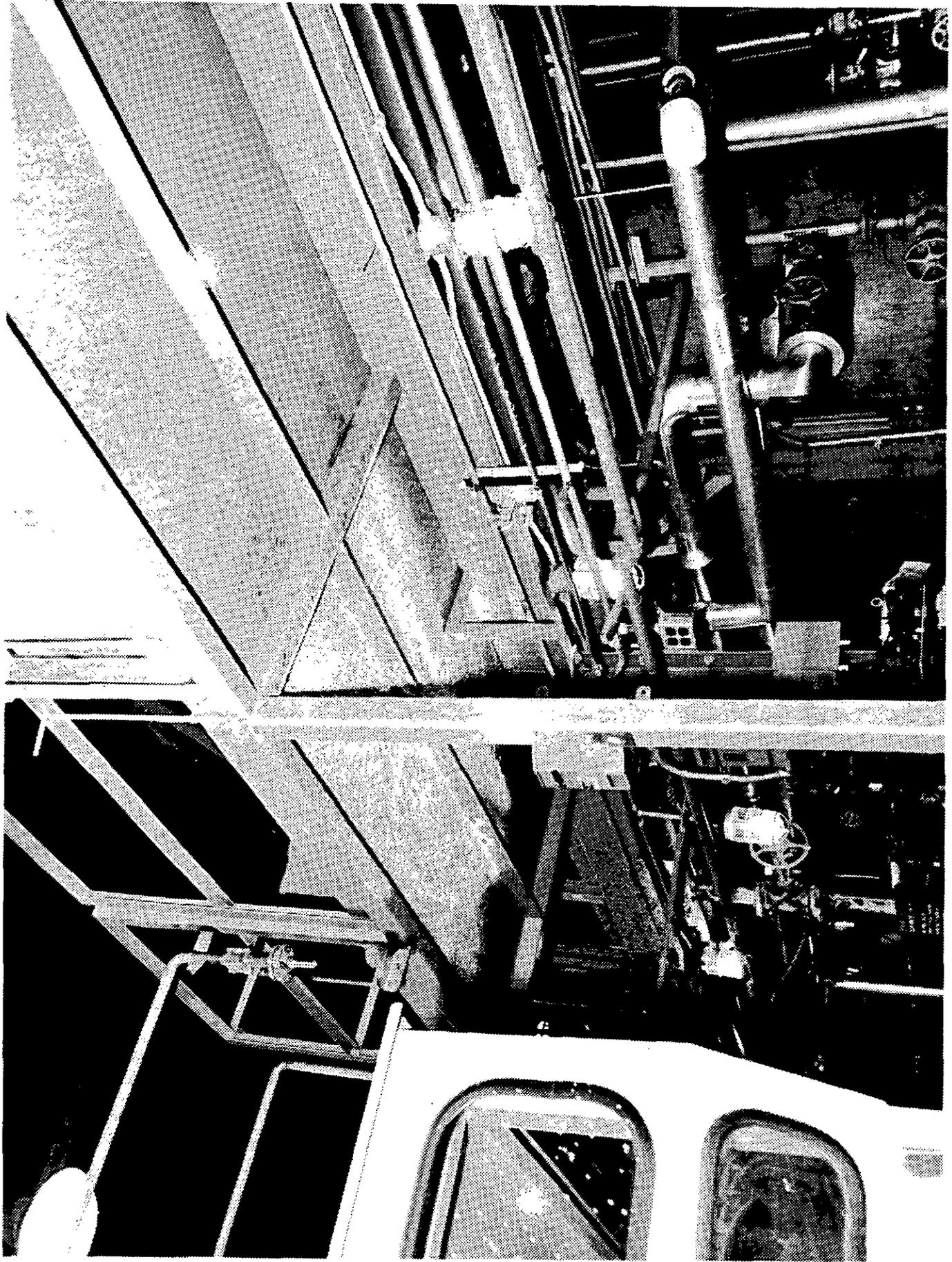


Figure 10. The foam clings to overhead surfaces, and allows longer contact of the decon chemical.

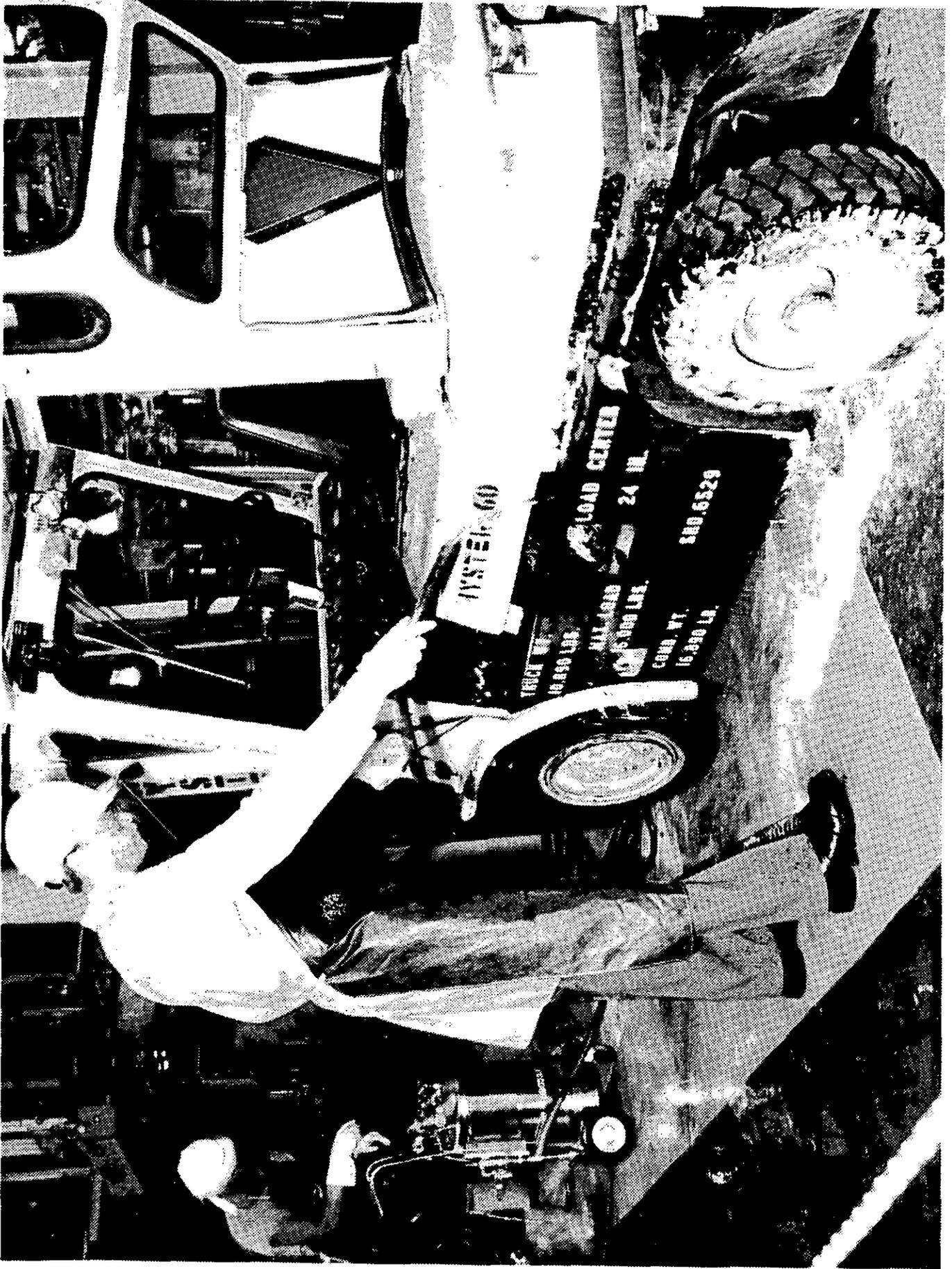


Figure 11. The foam is removed by spraying water onto the surface using an ordinary water hose.

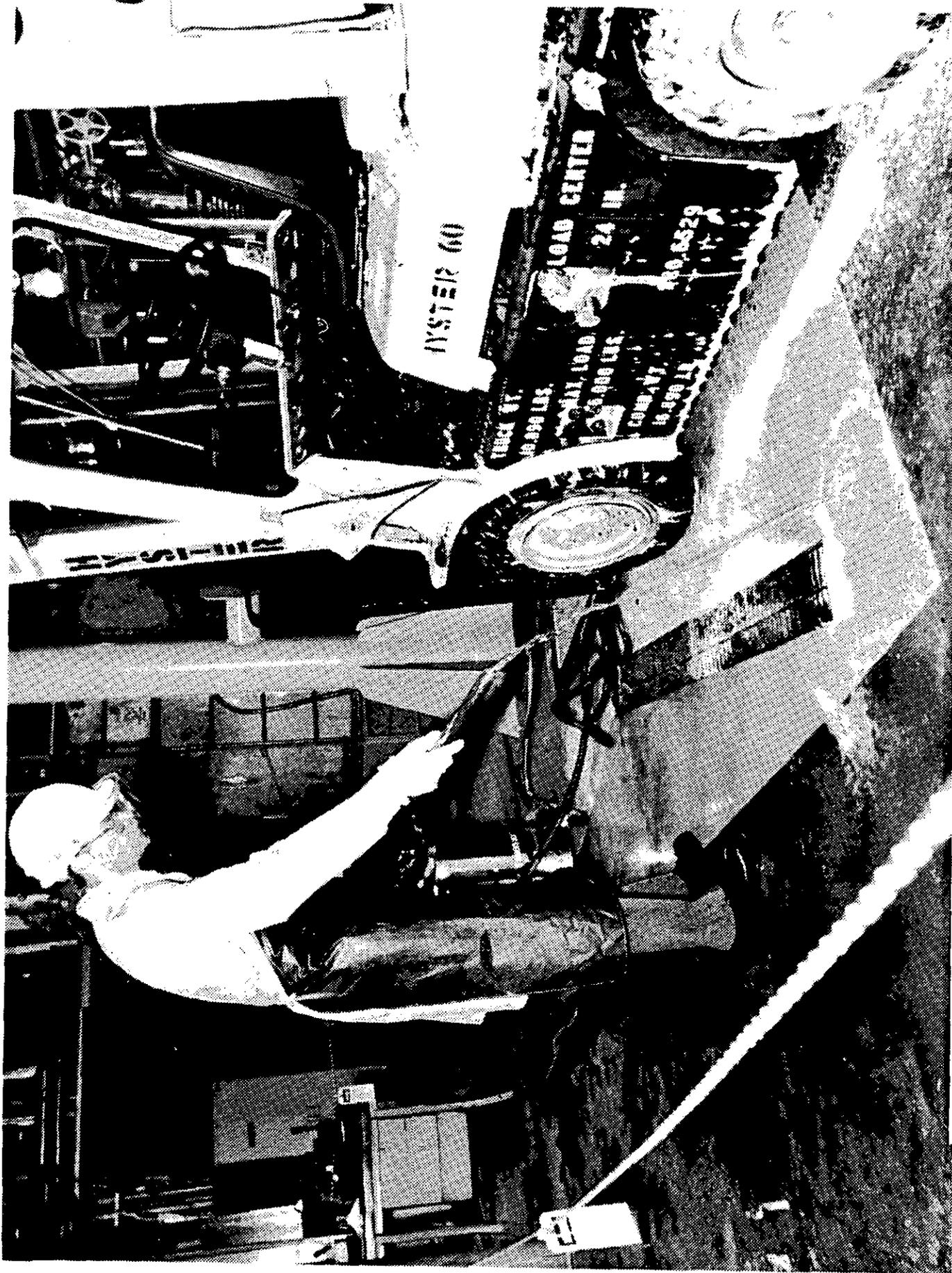


Figure 12. The foam is rinsed to a sump, and a defoaming agent is added to break down the foam before being steam jetted to the waste treatment facility.

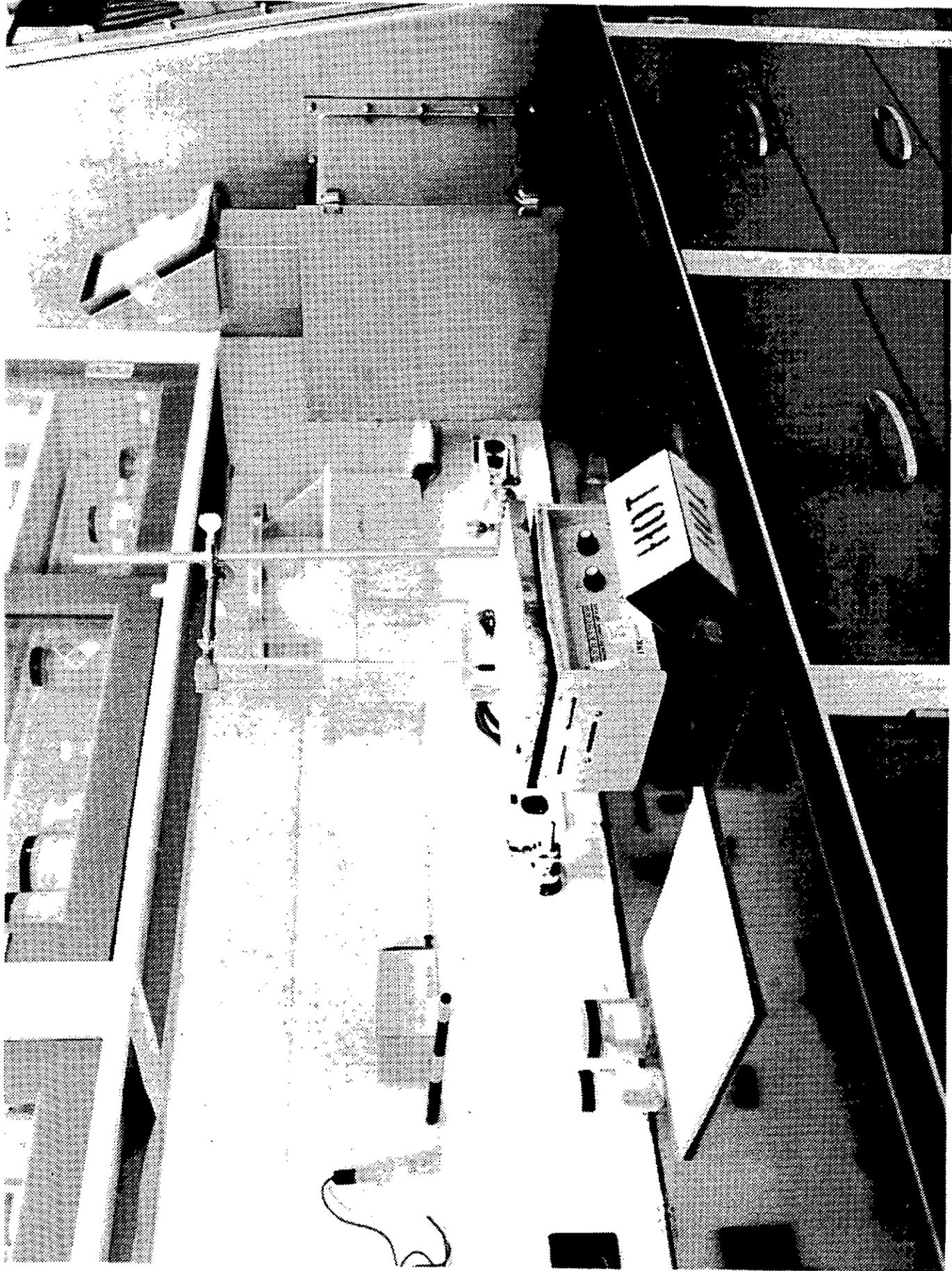


Figure 13. A breaker of water is heated to 180°F.



Figure 14. An SRS technician adds Jel-Add™ to the 180°F water.

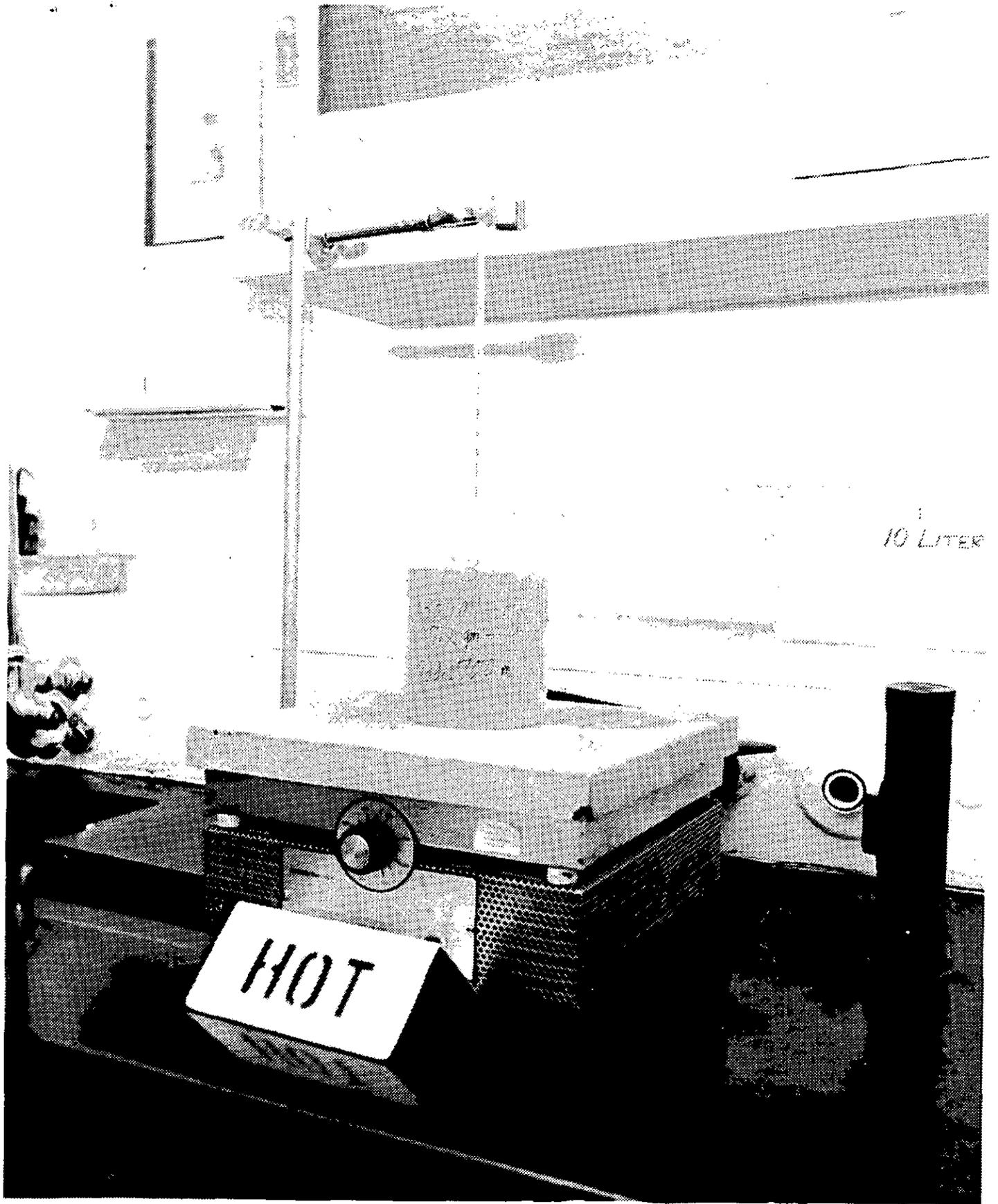


Figure 15. The gelled solution is evaporated.

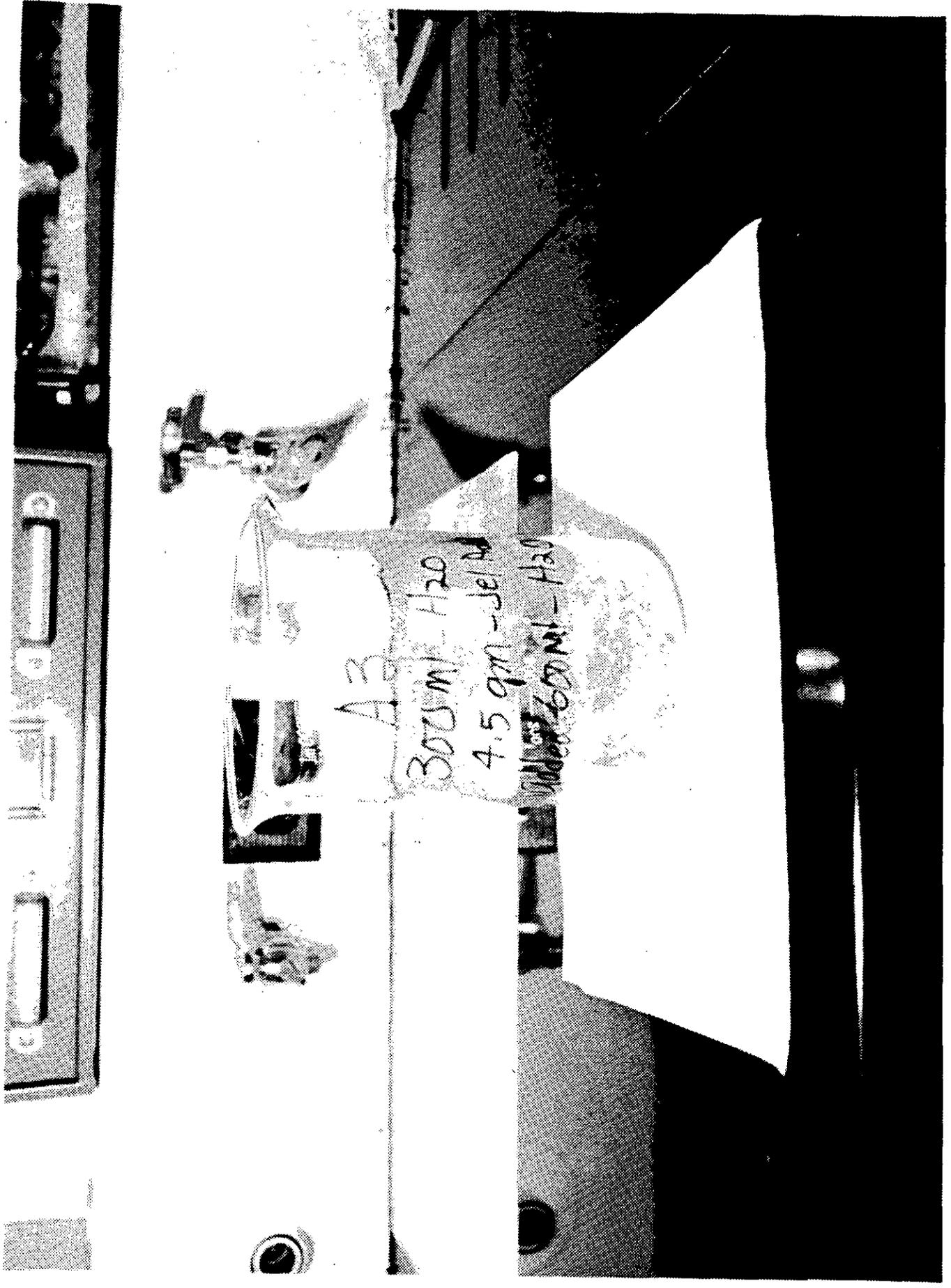


Figure 16. The evaporation recrystallizes the gel to its original form.



Figure 17. The crystals are similar to the Jel-Add™'s original yellow-orange powder.