



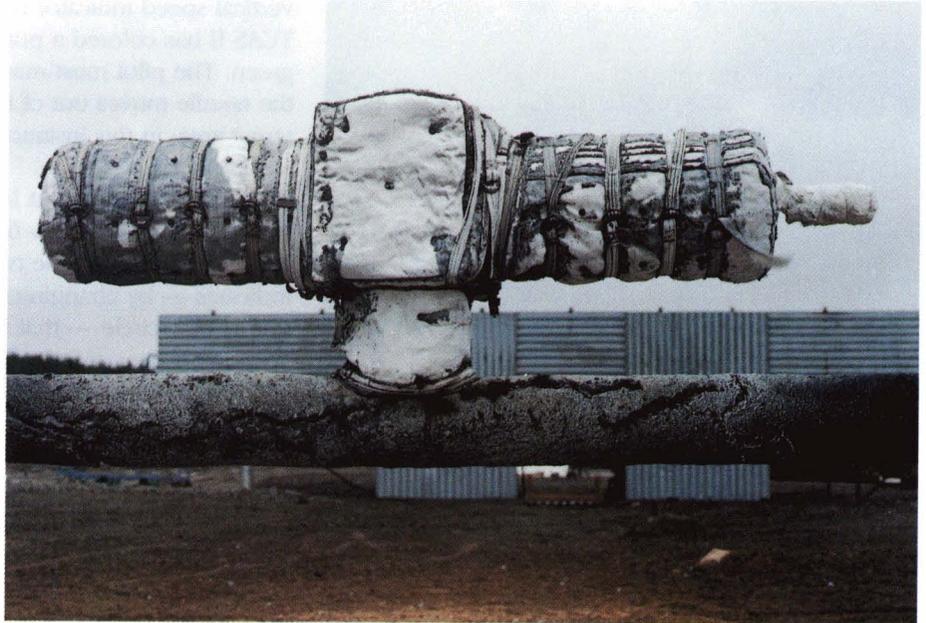
Fire Protection Jacket

The jackets protect the equipment from the extreme temperatures of intense hydrocarbon fires

At right is one of the PC1200 Series Fire Protection Jackets developed by Paul-Munroe Engineering, Orange, California, to protect the oil conduit system that carries crude oil and gas from wells beneath the sea to an offshore drilling platform. The jacket is shown after protecting a valve actuator from a 30-minute exposure to high velocity, gas-fed flames.

Fitted over pumps, cable trays, electrical equipment, riser tensioners, valve actuators and other apparatus, the jackets protect the equipment from the extreme temperatures of intense hydrocarbon fires that cause buckling and could cause structural failure of the entire platform. Protection of vital structural components can save lives and give firefighters additional time to extinguish oil field fires.

The jackets are designed to withstand temperatures of 2000 degrees Fahrenheit for four hours or more; this window of extra time before destruction of equipment is significant in relation to improved evacuation methods and health/safety standards. The flame-proof jacketing was developed



from a combination of ceramic cloth and other laminates used in astronaut space suit designs. The ceramic material developed for the cloth is similar to that developed by NASA for the tiles that protect Space Shuttle surfaces from the heat of re-entry.

Paul-Munroe was aided in the jacketing development by NERAC, Inc., Tolland, Connecticut, one of 10 NASA-sponsored Industrial Applications Centers that provide informational and problem-solving assistance to industrial and other clients. Through information obtained from NERAC, Paul-Munroe was able to locate specialists that used the Shuttle-type ceramic fibers and as a result they concluded an agreement for production and marketing of the jacketing system.