PLAINTIFF'S EXHIBIT
CHV-138

APPENDIX NO. IV

SAFETY INSTRUCTION SHEET - PUMPS

FORMS MFG. 600-1 AND 6

Form Mfg. 600-6 should be used for all centrifugal pumps and for those reciprocating pumps which because of their special nature or service justify a more detailed presentation of data and operating limits. Form Mfg. 600-1 may be used for most reciprocating pumps. The engineer shall exercise his judgment in selecting the exceptions among the reciprocating pumps. Each pump should be listed on one or the other forms to give a complete record of the plant equipment. Any special hazards such as piping arrangements which permit double heading of pumps should be noted.

NO.	SUBJECT	DISCUSSION
1 to 42		Refer to Appendices I, II, and III for the discussion.
43	DESIGN PRESSURE	The pressure limit is the maximum possible operating pressure and will usually be based on a safety valve setting, the maximum pump differential, or a combination of the two. For centrifugal pumps, the maximum differential pressure will be dependent on the maximum speed, which shall be taken as the normal speed for motor drives and as the overspeed setting for turbine drives. For the majority of services the temperature limit is not important and in any event the upper temperature limit for a pump purchased for normal service will probably not be known. This space should, therefore, be left blank except where temperature is an important factor, e.g., hot oil pumps.
44	MAX. SAFE SPEED	In some special cases it may be desirable to set a maximum safe speed for a centrifugal pump; but in general this value will not be known and the space should be left blank. However, on turbines and reciprocating pumps, the manufacturer's recommended maximum speed is usually available and should be entered here, and a footnote added to the bottom of the page stating, "turbine manufacturer's recommended maximum," or "pump manufacturer's recommended maximum."
45	TEST PRESSURE	A routine hydrostatic test is not normally applied to pump or turbine cases. Therefore, this item should be left blank by design engineer, and if a routine hydrostatic test is required, the proper test can be determined in the field by reference to the manufacturer's shop test pressure given

PUMPS (Cont'd)

NO.	SUBJECT	DISCUSSION
45	TEST PRESSURE (Cont'd)	under equipment data, above. It is particularly hazardous to show a routine test pressure on turbines, because they are usually designed to withstand only the pressures actually exerted at various points throughout the case under operation conditions. For example, the inlet to a turbine is designed adequately strong to withstand the inlet pressure; but a very short distance beyond the inlet point a turbine case is no longer able to withstand the full inlet pressure, and finally, at the point of exhaust, the case is only able to withstand pressures moderately above the exhaust pressure. Likewise, there are many types of pumps whose suction chambers are not capable of withstanding the test pressure applied to the discharge side.
46	DESCRIPTION	This should include the pump's service and number, the name of the manufacturer, type and size of pump, the manufacturer's serial number, the steam end pressure and any other data available.
47	THICKNESS	Except when the corrosion allowance and minimum thickness data is readily available these may be left blank.

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