



**Consumers
Power
Company**

COPY

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Director, Nuclear Reactor Regulation
Att Mr Dennis M Crutchfield, Chief
Operating Reactors Branch No 5
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT - SEP TOPIC XV-15, INADVERTENT
OPFVING OF A PWR PRESSURIZER SAFETY/RELIEF VALVE OR
A BWR SAFETY/RELIEF VALVE

Attached is the Consumers Power Company evaluation of SEP Topic XV-15 for
the Big Rock Point Plant.

Robert A Vincent (Signed)

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CC Director, Region III, USNRC
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Topic IX-15: Inadvertent Opening of a PWR Pressurizer Safety/Relief Valve or a BWR Safety/Relief Valve

Evaluation: Big Rock Point utilizes mechanically operated safety valves for reactor system overpressure protection. The six safety valves are mounted on the top of the steam drum and set to relieve at pressures between 1550 and 1660 psia. Each safety valve has an effective flow area of .028 ft² and cannot be isolated. Normal reactor system operating pressure is 1350 psia, and the emergency condenser is automatically actuated at 1450 psia. If at least one of the two emergency condenser tube bundles is placed in service, analyses (based on actual plant performance testing of the emergency condenser) shows that the lowest relief valve setpoint will not be reached for any anticipated transients.

Big Rock Point also utilizes solenoid operated relief valves as part of its emergency core cooling system. These valves comprise the reactor depressurization system (RDS) and are automatically opened on coincident signals of low steam drum level, low reactor water level, and high fire header pressure to blowdown the reactor coolant system and thereby permit injection of low pressure core spray water. In addition, each RDS valve may be manually operated from the control room, and an air operated isolation valve is provided upstream of each RDS valve to permit manual isolation of the blowdown path. Each RDS valve and its associated blowdown path has an effective flow area of 0.05 ft².

Inadvertent operation of a reactor coolant system safety or RDS valve is considered a loss of coolant accident. Following opening of the valve the initial pressure regulator will act to reduce steam flow to the turbine and thereby maintain pressure relatively constant until the reactor trips on high containment pressure. As BRP has no high pressure makeup system, other than main feedwater, capable of maintaining system inventory with a stuck open safety or RDS valve, water level will eventually fall to the RDS actuation setpoint and thereafter core cooling will be provided by core spray. (Note that the feedwater system would only be capable of providing sufficient makeup for a short period of time - less than 15 minutes before the condensate pumps trip on low condenser hot well level.)

The 0.05 ft² steam line break (equivalent to a stuck open PDS valve) was analyzed using the General Electric SAFE computer code.⁽¹⁾ The methods used in this analysis have been approved by the NRC staff as being in compliance with 10CFR50 Appendix K.⁽²⁾ The results of this analysis are shown on Figures 1-4. Less than one foot of reactor fuel (trace 2 on Figure 2) becomes uncovered during the event. Therefore no fuel heatup or fuel failure would be expected to occur and offsite dose consequences would be negligible. It is therefore concluded that BRP complies with current staff criteria (SRP 15.6.1) for this event.⁽³⁾

References

- (1) "Big Rock Point Plant: Loss-of-Coolant Accident Analysis for General Electric Fuel in Conformance with 10CFR50 Appendix K (Non-jet Pump Boiling Water Reactor)", July 11, 1975. This report was Appendix A of the July 25, 1975 submittal from Consumers Power Co. to the NRC, Docket 50-155, License DPR-6
- (2) Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Amendment No. 10 to Facility License No. DPR-6, Consumers Power Company Big Rock Point Plant Docket No. 50-155, June 4, 1976.

FIGURE 1

BIG ROCK PT

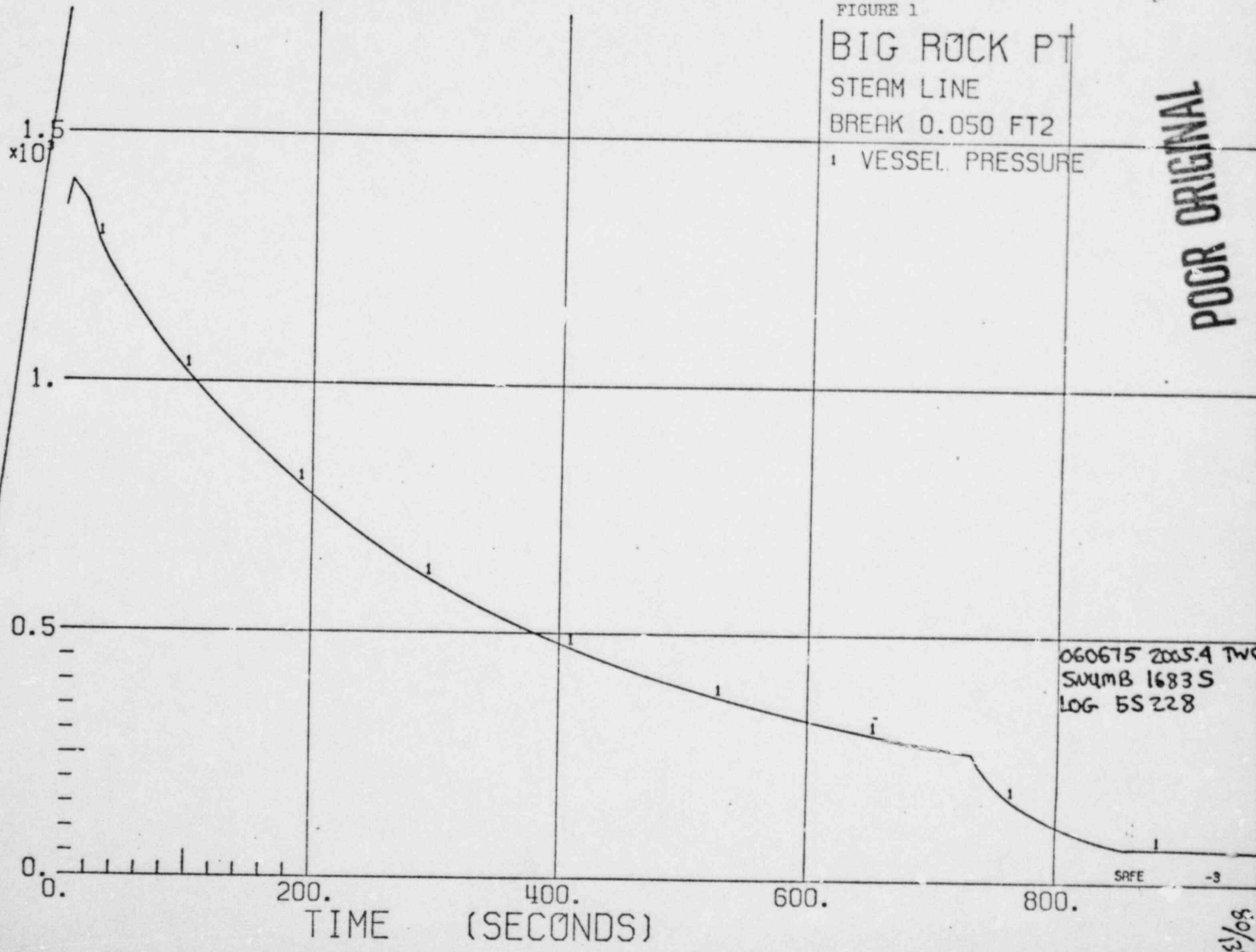
STEAM LINE

BREAK 0.050 FT2

1 VESSEL PRESSURE

POOR ORIGINAL

PRESSURE (PSIA)



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ORIGINAL
POOR

FIGURE 2
BIG ROCK PT
STEAM LINE
BREAK 0.050 FT2

- 1 REGION 1 LEVEL
- 2 REGION 2 LEVEL
- 3 REGION 3 LEVEL
- 4 REGION 4 LEVEL
- 5 COLLAPSED VESSEL LEVEL

WATER LEVEL (FEET)

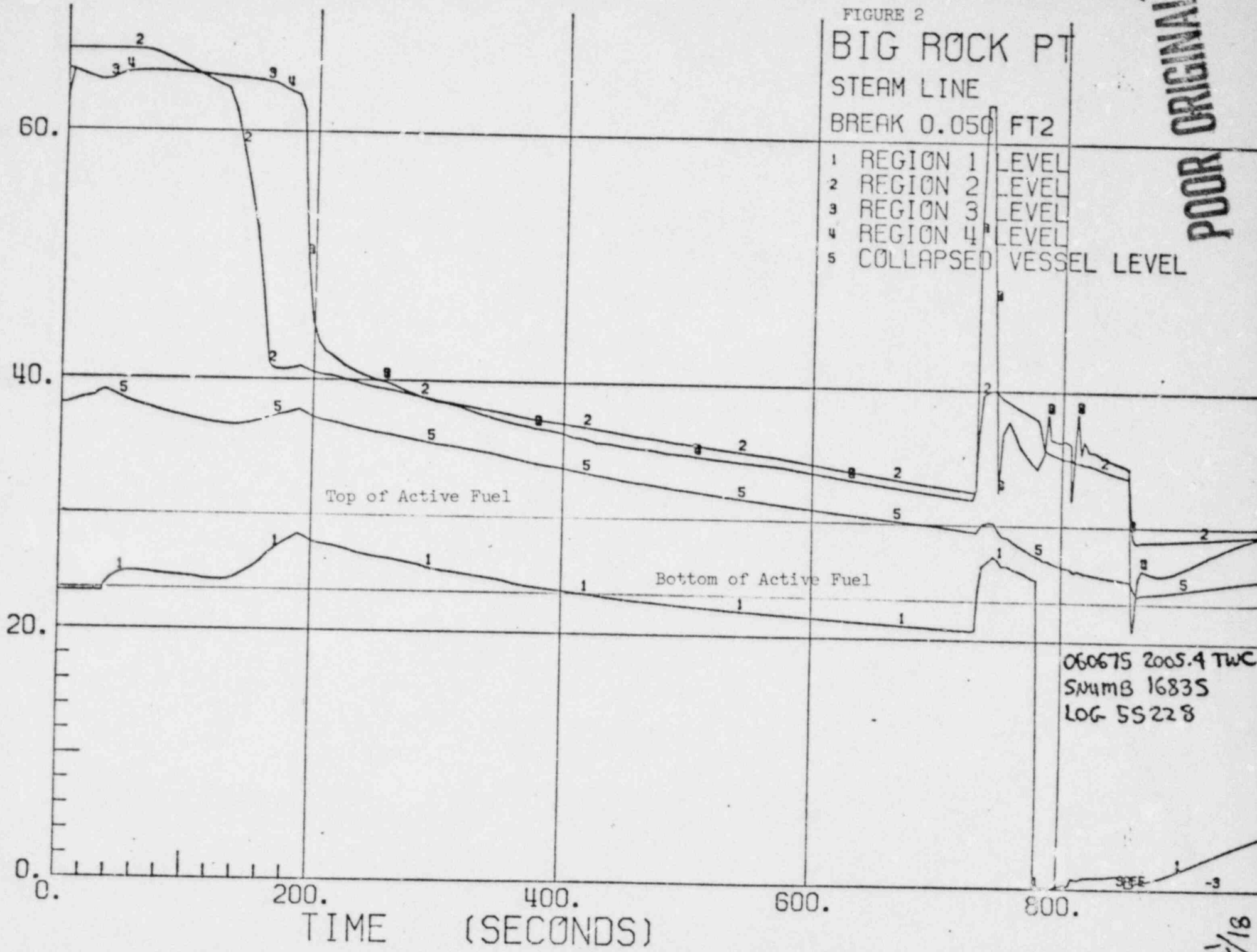


FIGURE 3

BIG ROCK PT

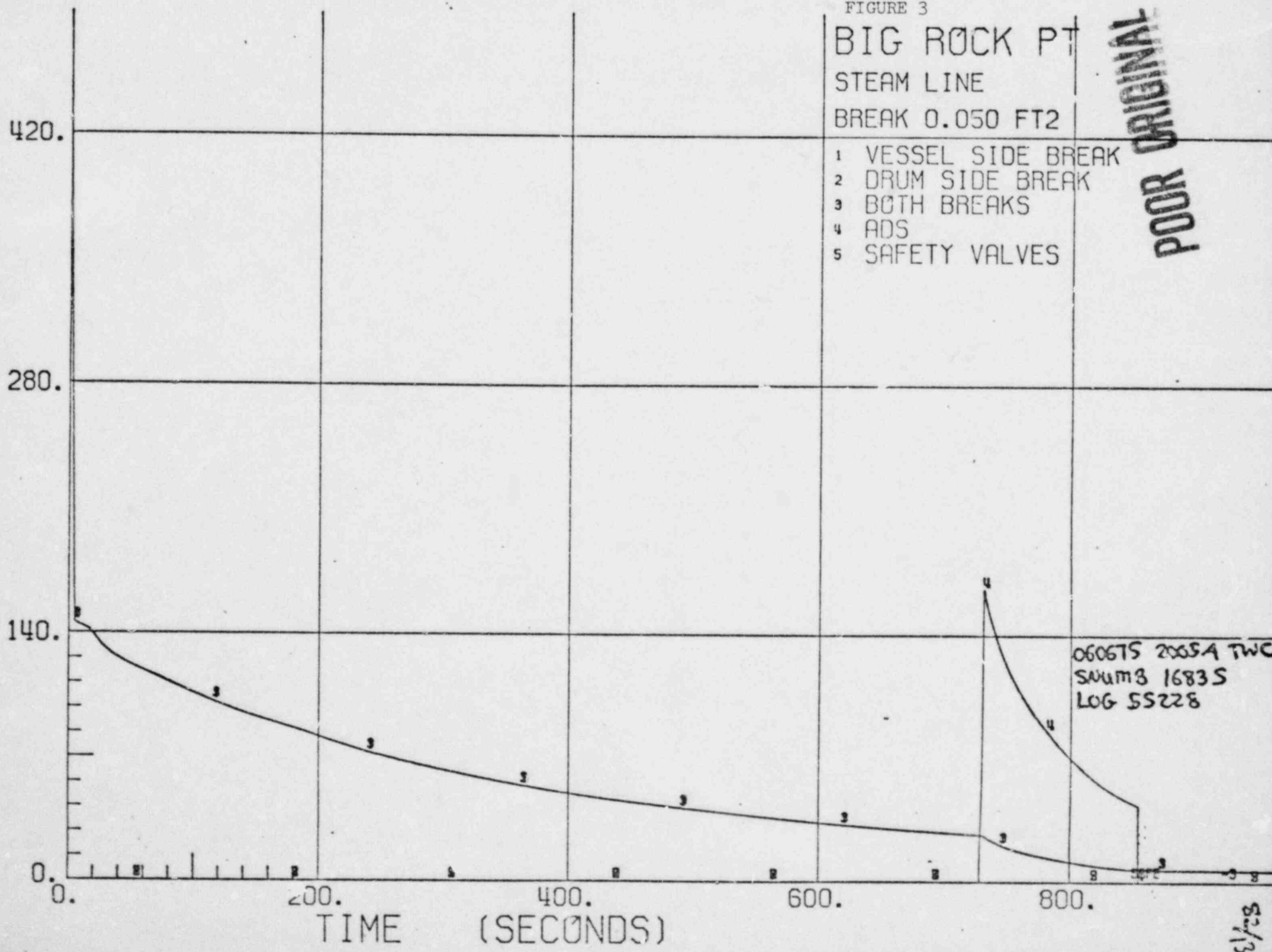
STEAM LINE

BREAK 0.050 FT²

- 1 VESSEL SIDE BREAK
- 2 DRUM SIDE BREAK
- 3 BOTH BREAKS
- 4 ADS
- 5 SAFETY VALVES

POOR ORIGINAL

FLOW (LBM/SEC)



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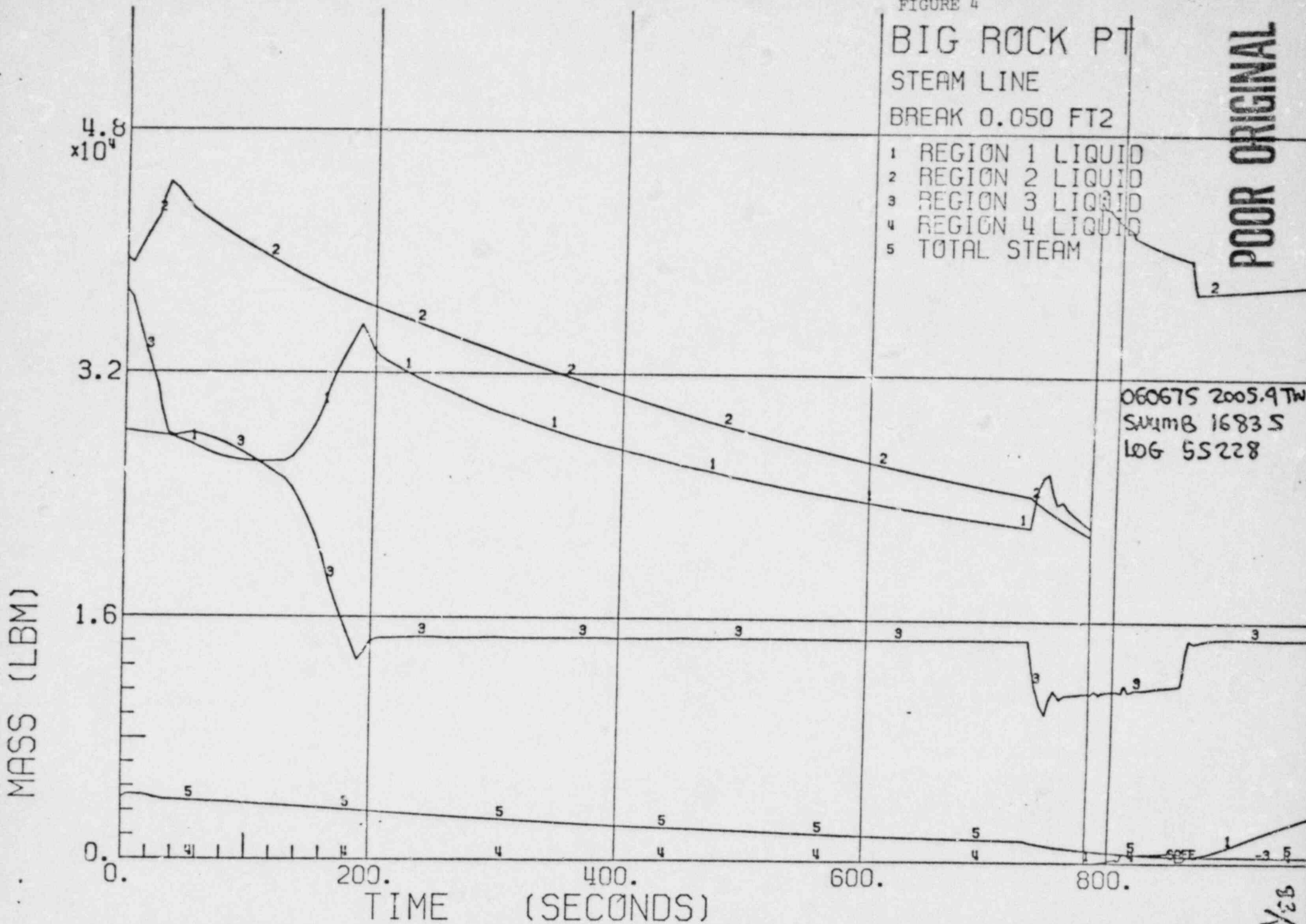
FIGURE 4

BIG ROCK PT
STEAM LINE
BREAK 0.050 FT2

- 1 REGION 1 LIQUID
- 2 REGION 2 LIQUID
- 3 REGION 3 LIQUID
- 4 REGION 4 LIQUID
- 5 TOTAL STEAM

POOR ORIGINAL

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