

SESSION 14

A COMBUSTION-GEOTHERMAL HYBRID POWER PLANT
FOR A GEOPRESSED WELL

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BACKGROUND

EPRI RESEARCH PROJECTS ON GEOPRESSURED ENERGY RESOURCES:

- REPORT EPRI AP-1457 "GEOPRESSURE ENERGY AVAILABILITY (1979-80)
- STUDY OF HYBRID CYCLES FOR GEOPRESSURED POWER PRODUCTION (1981-82)
- UPDATE ASSESSMENT AFTER DOE WELL TESTING (1982-83)
- PROJECT FEASIBILITY ASSESSMENT FOR PLEASANT BAYOU SITE (1983)

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CONCLUSIONS:

- RESOURCE SIZE SIGNIFICANT BUT WELLS TOO EXPENSIVE FOR GAS PRODUCTION
- COMBINED CYCLE PREFERRED APPROACH TO POWER GENERATION
 - HYDRAULIC (PRESSURE REDUCTION) TURBINE
 - COMBUSTION WITH WASTE HEAT RECOVERY
 - GEOTHERMAL ASSISTED BY WASTE HEAT
- LONG-TERM FLOW TEST WILL ASSIST FUTURE RESOURCE ASSESSMENT
- HYBRID PROJECT APPEARS FEASIBLE NOW ON GEOPRESSURED WELL
- HYBRID TEST DATA USEFUL FOR HYDROTHERMAL APPLICATION

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PROJECT OBJECTIVES

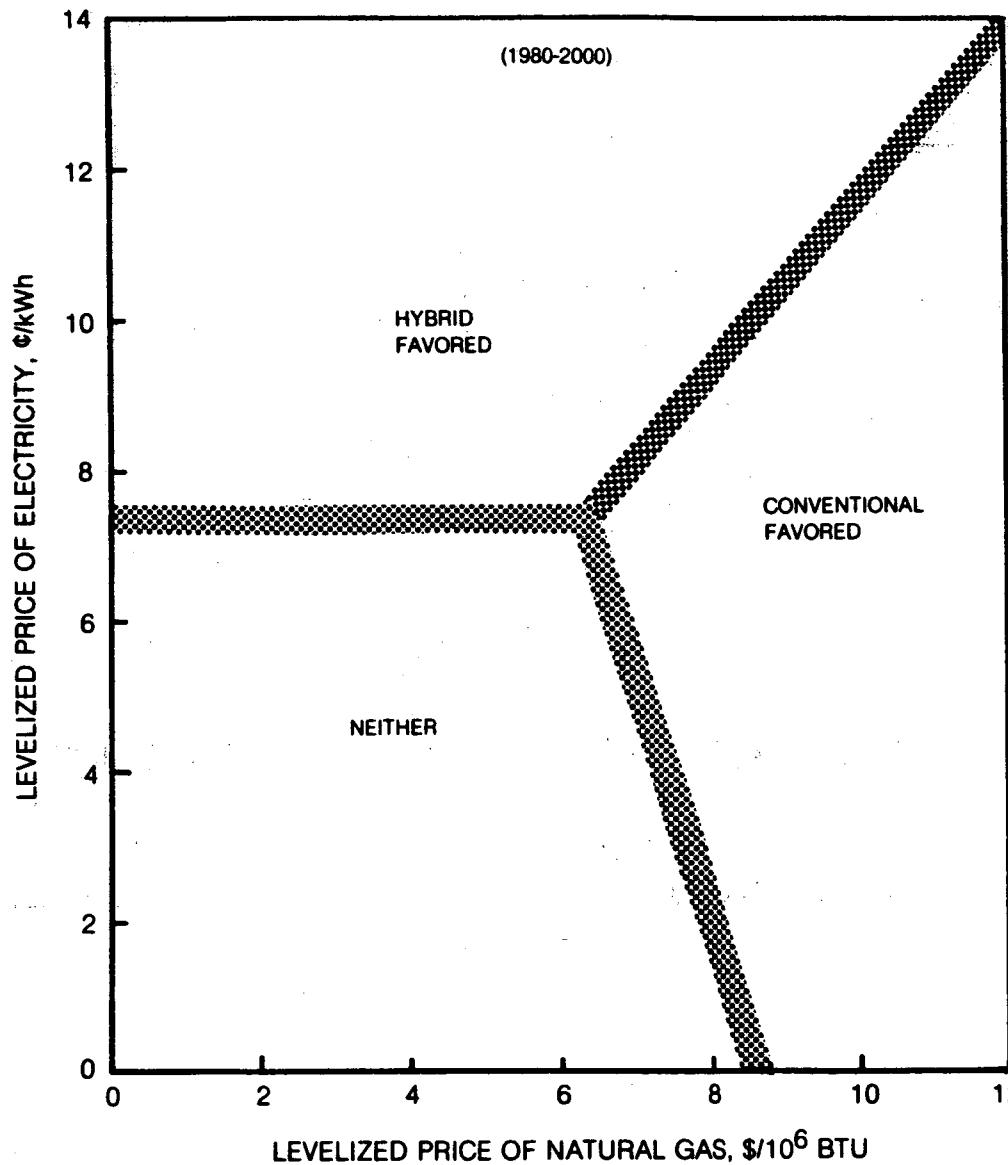
- EVALUATE THE COMBUSTION-GEOTHERMAL HYBRID POWER CONVERSION CONCEPT AT THE PLEASANT BAYOU GEOPRESSED WELL.
- OBTAIN GEOPRESSED RESERVOIR AND FLUID DATA IN LONG-TERM (3 - 5 YEARS) FLOW TEST

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ECONOMIC COMPARISON OF GEOPRESSED POWER SYSTEMS

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HYBRID: EFFICIENCY AND FUEL ADVANTAGES

CYCLE:

- o HYDROTHERMAL RESOURCE, 392°F (200°C)
- o GAS TURBINE TOPPED, 2-STAGE FLASH

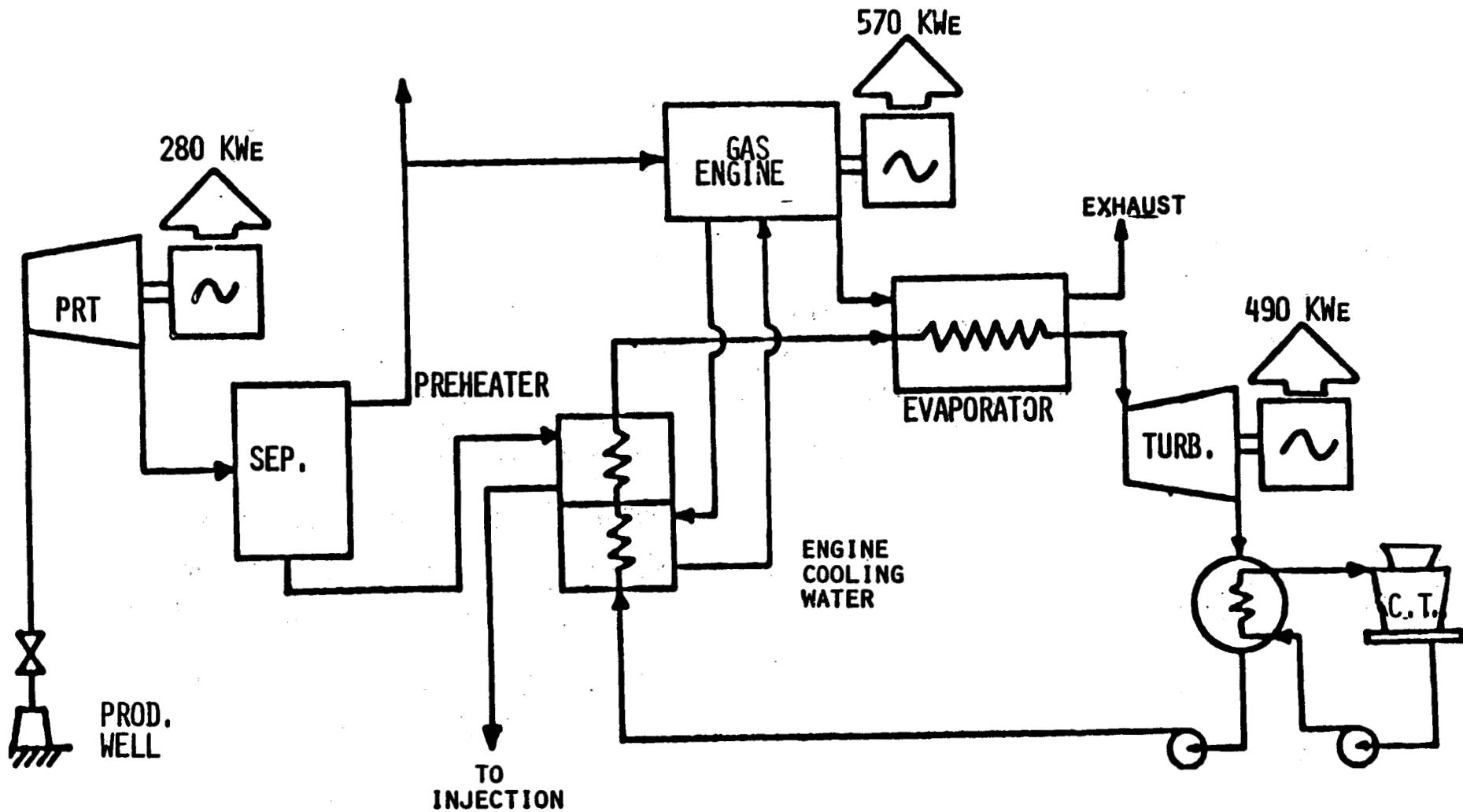
DEFINITIONS:

- o W = WORK OUT OF HYBRID PLANT USING GIVEN FLUID AND FUEL QUANTITIES
- o WG = WORK OUT OF SEPARATE GEOTHERMAL PLANT USING SAME FLUID FLOW
- o WF = WORK OUT OF SEPARATE FOSSIL PLANT USING SAME FUEL

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<u>EFFICIENCIES:</u>	TOTAL SYSTEM	FUEL	GEOTHERMAL
	$\frac{W}{WF + WG} = 1.15$	$\frac{W-WG}{WF} = 1.34$	$\frac{W-WF}{WG} = 1.28$

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GEOPRESSURED HYBRID POWER CYCLE
(GAS ENGINE BINARY)

DESIGN BASIS

- 0 PLEASANT BAYOU NO. 2 PRODUCTION WELL
- 0 20,000 BARRELS PER DAY BRINE PRODUCTION
- 0 GAS SEPARATION AT 200 PSIA
- 0 HALF OF GAS (175 MCF/DAY) TO HYBRID CYCLE
- 0 HALF OF BRINE TO HYBRID CYCLE

