

ELECTRICITY RELIABILITY IN REGULATED AND
COMPETITIVE MARKETS
AN INDUSTRIAL PERSPECTIVE

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HARVARD ELECTRICITY POLICY GROUP SPECIAL SEMINAR

On
Reliability, Capacity Requirements and the Obligation to Serve in A Competitive
Market

Cambridge, Massachusetts
September 27, 1995

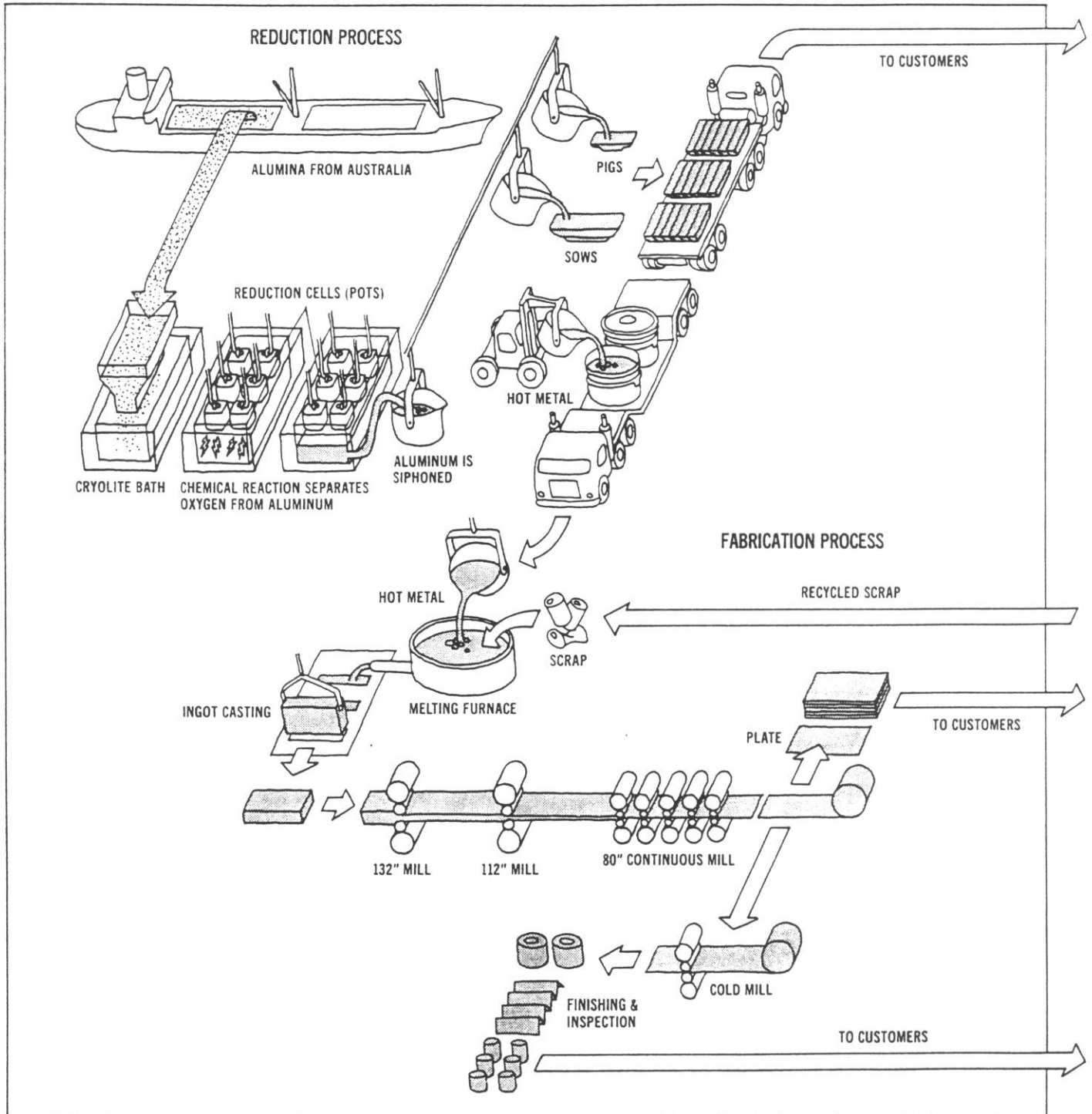
ELECTRICITY IS A MANUFACTURED PRODUCT
WITH ALTERNATIVE USES

FUEL

POWER

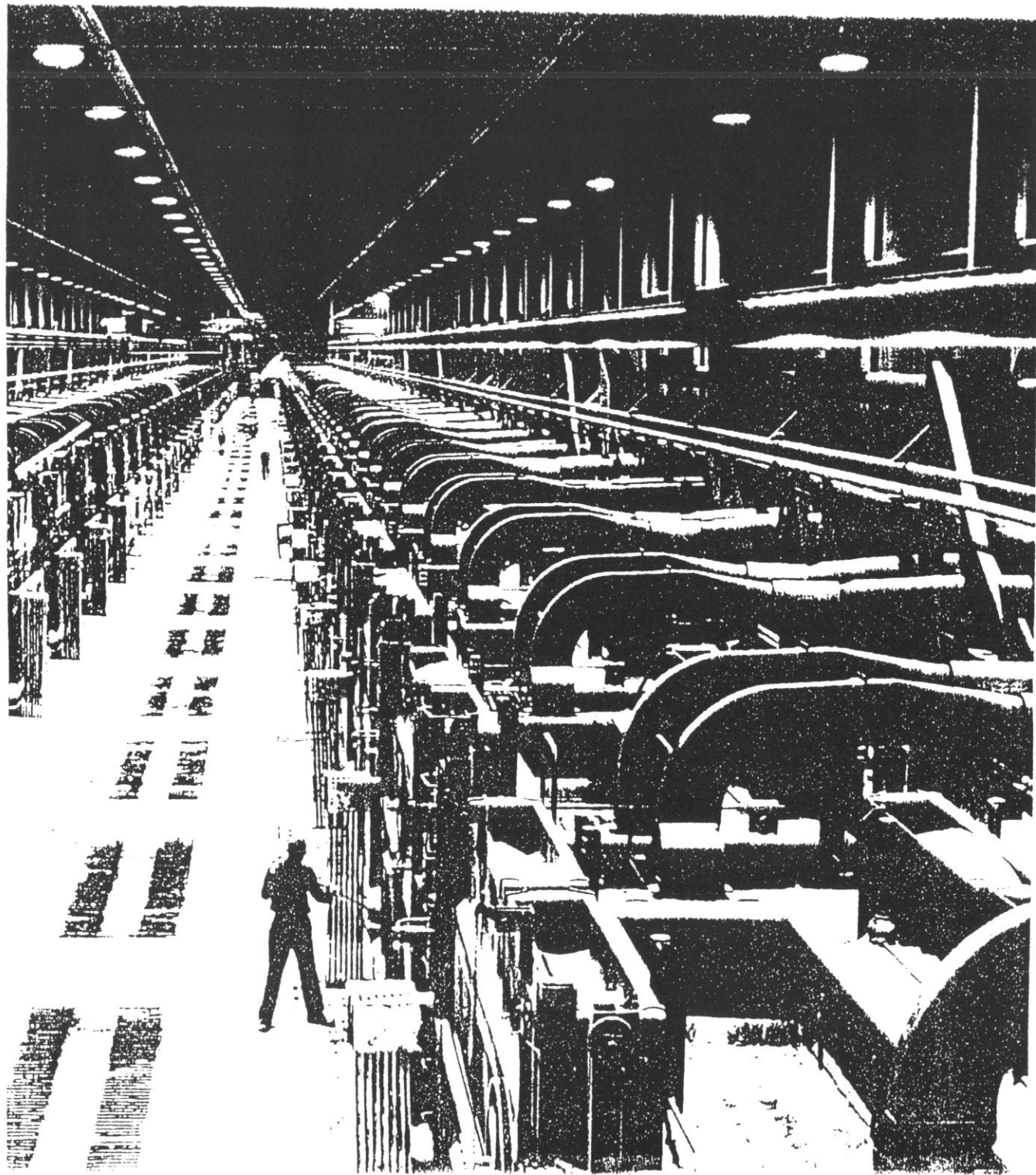
FEEDSTOCK

FROM RAW MATERIAL TO FINISHED PRODUCT.

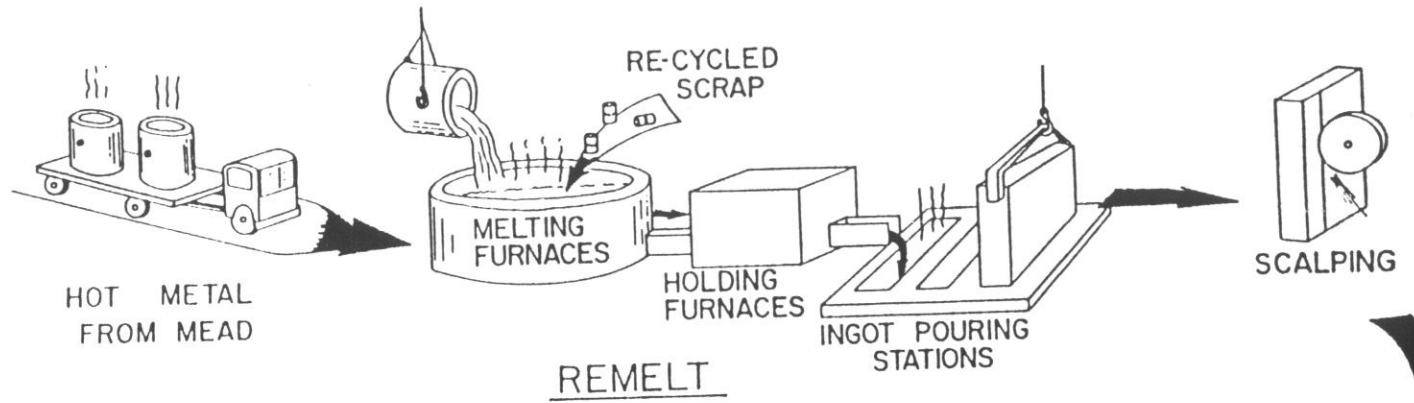


**KAISER ALUMINUM
& CHEMICAL CORPORATION**

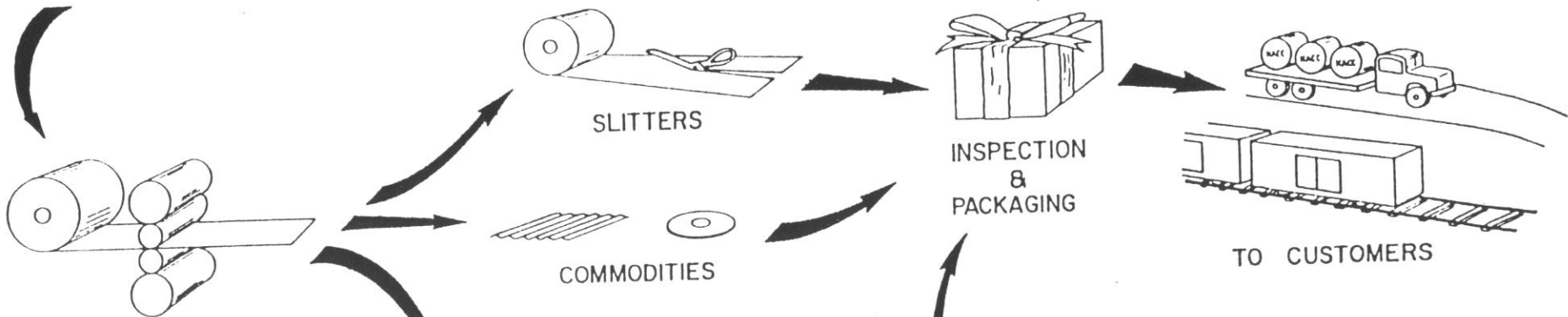
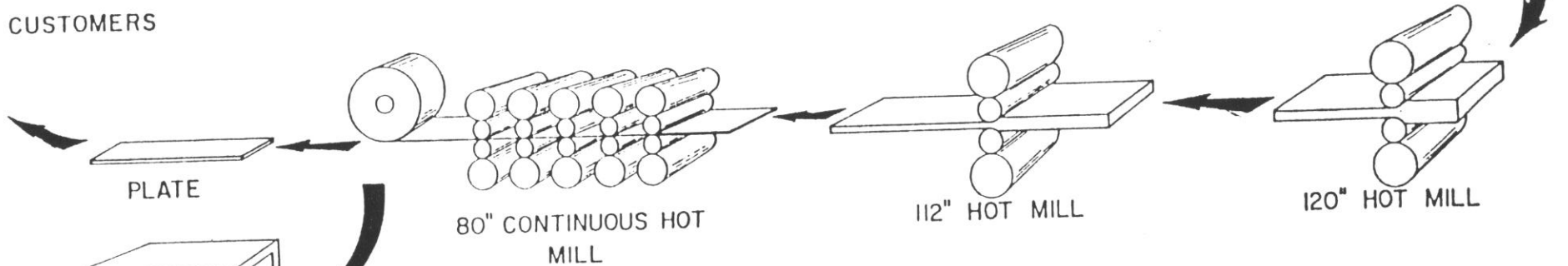
303 Washington Mutual Building
Spokane, WA 99201
509-624-3116



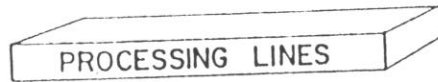
1 KAISER ALUMINUM
TRENTWOOD



TO CUSTOMERS



COLD MILLS



FINISHING

PURCHASERS OF ELECTRICITY USE A VARIETY OF TRADITIONAL MARKET CONCEPTS IN THEIR PURCHASE DECISIONS

INTENDED USE

PRODUCT CHARACTERISTICS (AC/DC, VOLTAGE, AMPERAGE, etc.)

PRODUCT QUALITY

IN PLANT PROCESSING OPPORTUNITIES AND/OR REQUIREMENTS

PRICE

DELIVERABILITY

ON SIGHT STOCKPILING

ALTERNATIVE PRODUCTS

ALTERNATIVE SUPPLIERS

PRODUCT AND SUPPLIER RELIABILITY FACTORS FOR ELECTRICITY INCLUDE

SPECIFIED PRODUCT CHARACTERISTICS

“WITHIN SPEC” PRODUCT QUALITY

CONTRACTED VOLUME DELIVERY

ON TIME DELIVERY

PRICE PERFORMANCE

POTENTIAL RELIABILITY PROBLEM AREAS

GENERATION

FUEL OR POWER SUPPLY

EQUIPMENT

TRANSMISSION SYSTEM

DISTRIBUTION SYSTEM

USER PROBLEMS

DEMAND CHARACTERISTICS

EQUIPMENT MALFUNCTIONS

KAISER EXPERIENCES WITH MAJOR RELIABILITY PROBLEMS

GENERATION

DROUGHT IN AFRICA (HYDROPOWER)

LOW SNOW FALL IN US - NW (HYDROPOWER)

FISH FLUSH AND SPILLS IN US - NW

VOLCANO ERUPTION IN US - NW

FUEL SUPPLY/EQUIPMENT INTERRUPTIONS IN
US - MW AND LA

GAS PRICE SPIKES IN US - LA

TRANSMISSION / DISTRIBUTION

EARTHQUAKE IN US - CA

HURRICANE/FLOODING IN US - LA AND
CARIBBEAN

TRANSFORMER DAMAGE IN US - MW

USER PROBLEMS

COLD WEATHER DEMAND IN US - MW AND SE

RESIDENTIAL RELIABILITY ALTERNATIVES

POWER INTERRUPTION - BATTERY POWERED LIGHTS

BATTERY BACK-UPS FOR CLOCKS

COMPUTER SOFTWARE AUTOMATIC BACK-UP FEATURES

SURGE PROTECTORS

UNINTERRUPTIBLE POWER SOURCE (UPS) FOR COMPUTER

ALSO UTILIZED:

FIREPLACE

CANDLES

HURRICANE LAMPS

BATTERY POWERED RADIOS AND TV'S

INDUSTRIAL USER MANAGEMENT OPTIONS RELIABILITY IN GENERATION

**REGULATION OF UTILITY SUPPLIER WITH MONOPOLY
POWER**

SELF GENERATION

SELECTION OF GENERATOR(S) IN COMPETITIVE MARKET

**CONTRACTUAL PROVISIONS WITH COMPETITIVE
GENERATOR(S)**

**MANAGEMENT OF INDUSTRIAL OPERATIONS FOR
OPTIMIZATION OF RELIABILITY/COST TRADE-OFFS**

PRODUCTION SCHEDULE ALTERATIONS

ALTERNATIVE POWER USE

PRODUCTION EQUIPMENT CHANGES

PROCESS CHANGES

KAISER GENERATOR SELECTIONS

TRADITIONAL UTILITY

INVESTOR OWNED UTILITIES

FEDERAL POWER MARKETING ADMINISTRATIONS - BPA

PUBLIC POWER ENTITIES

SELF GENERATION

COGENERATION WITH GAS FUELED STEAM BOILER

GAS FUELED STEAM TURBINES

NORDBERG RADIAL GAS ENGINES

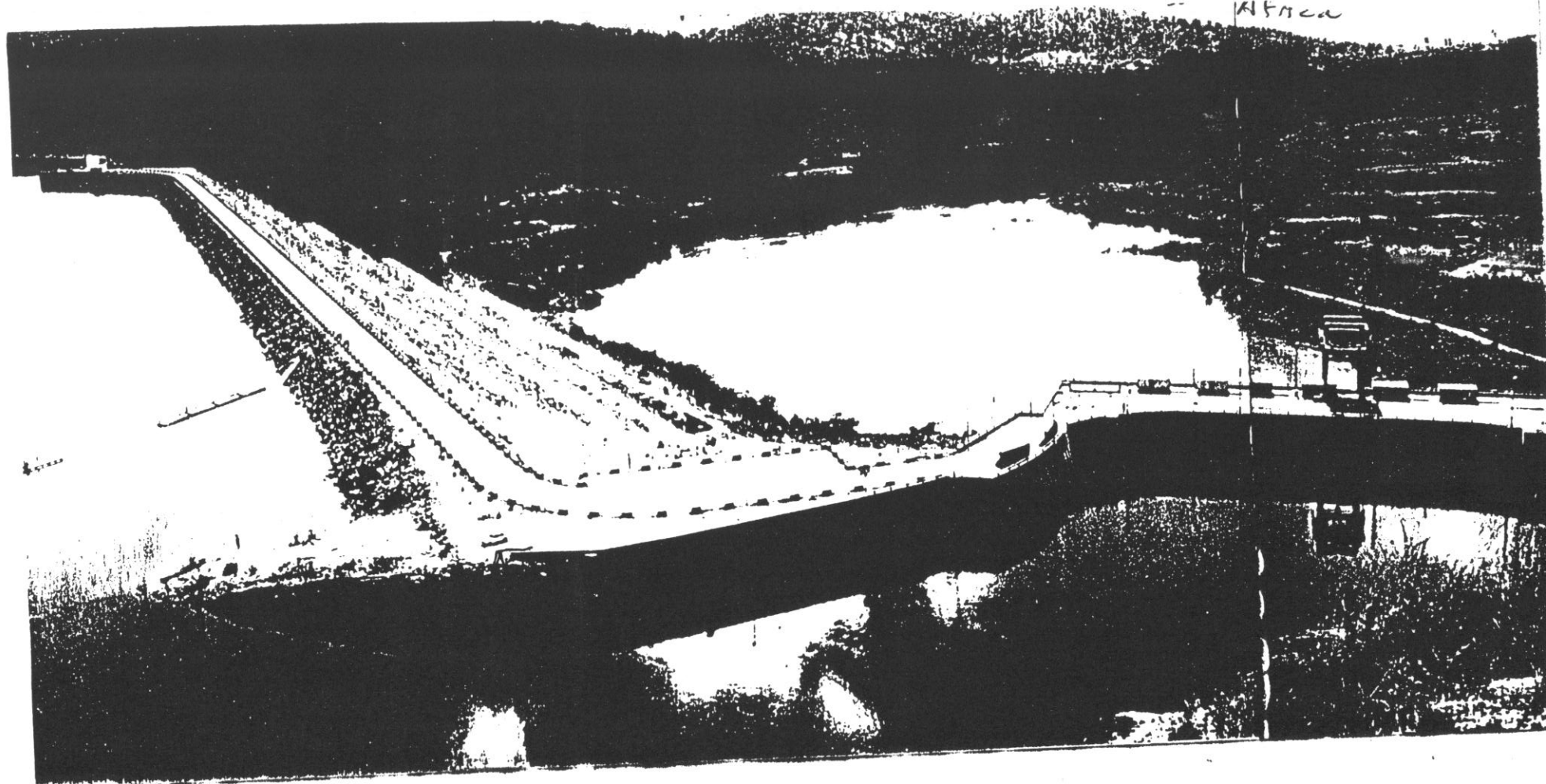
OTHER

COST BASED - GENERATING FACILITY SPECIFIC
CONTRACT WITH IOU

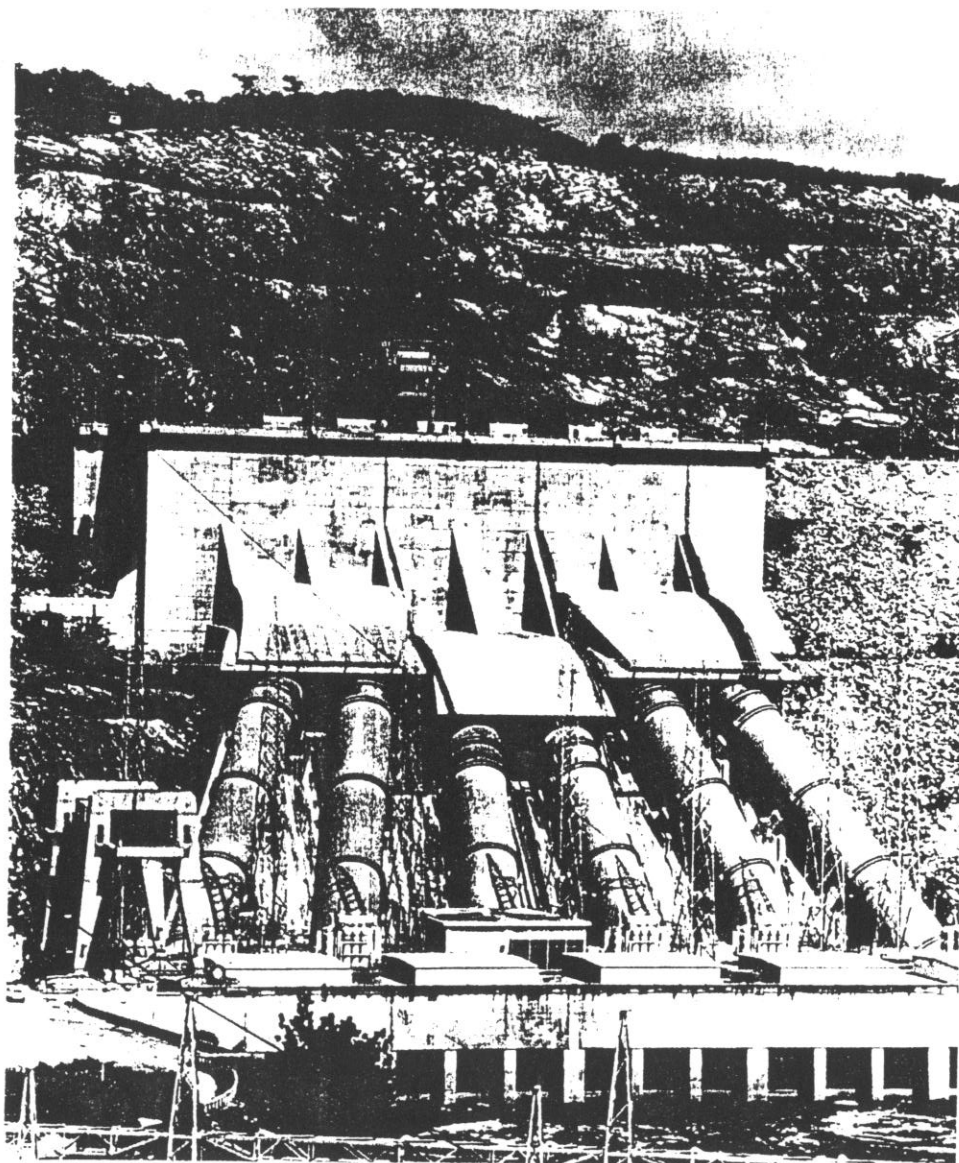
COMPANY CONSTRUCTED HYDRO FACILITY RUN BY
GOVERNMENT POWER AUTHORITY - VRA

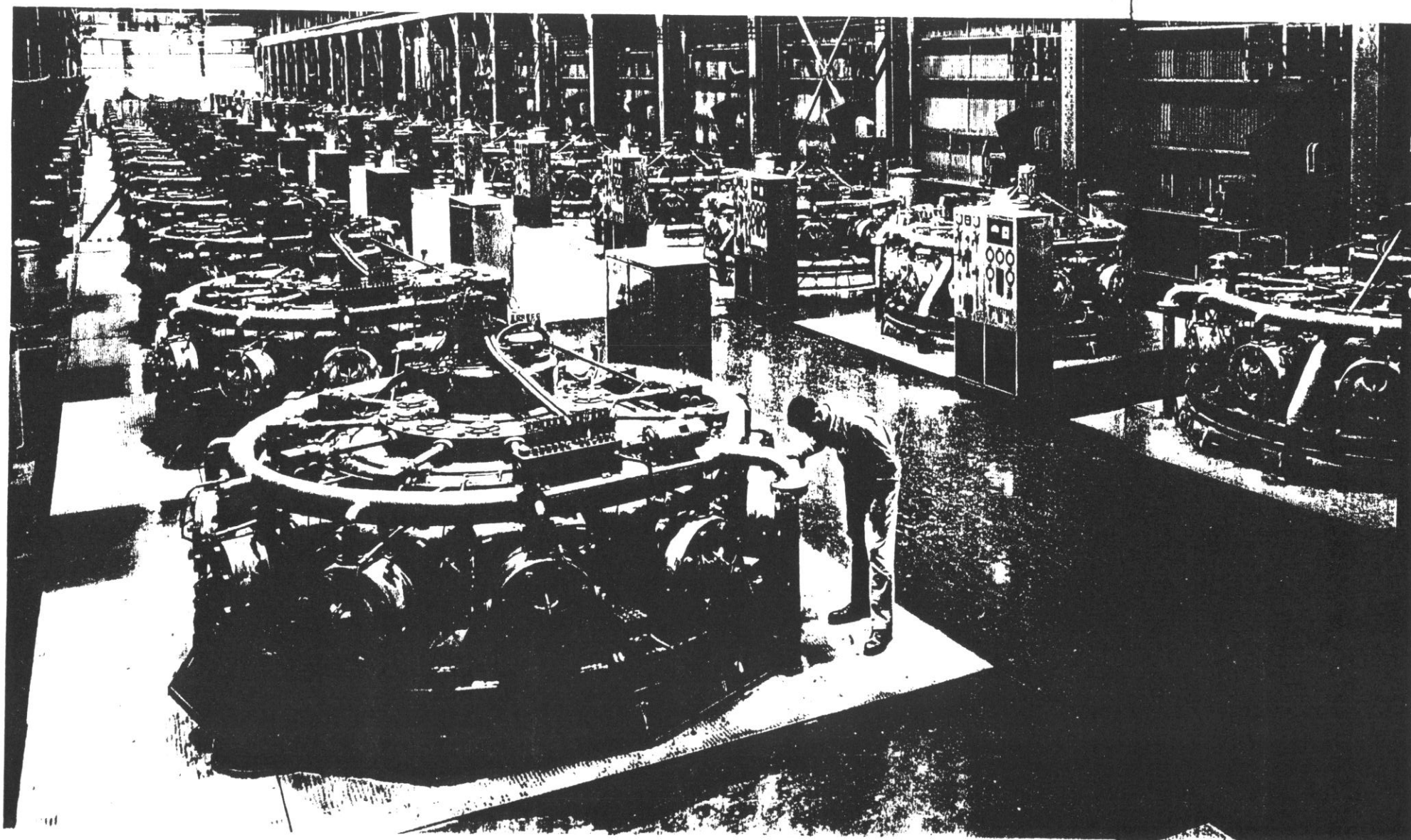
COMPETITION BASED FOREIGN ELECTRICITY SYSTEMS

OFF-SYSTEM PURCHASES WITH BPA WHEELING PENDING



Alfred





KEY QUESTIONS IN RELIABILITY

WHAT RISKS DOES COMPETITION IN GENERATION IMPOSE?

WHAT RISKS DOES RETAIL WHEELING IMPOSE?

HOW IMPORTANT ARE THESE RISKS RELATIVE TO EXISTING RELIABILITY FACTORS?

WHAT ARE THE IMPACTS OF NEW TECHNOLOGICAL DEVELOPMENTS?

WHAT ARE THE ADVANTAGES OF ALLOWING MARKET FACTORS TO OPERATE IN THE INDUSTRIAL SECTORS ON RELIABILITY?

HOW DO THE RISKS OF COMPETITION IN GENERATION AND RETAIL WHEELING RANK RELATIVE TO THE RELIABILITY RISKS OF NEW MARKETS FOR ELECTRICITY USE?

ELECTRICITY CONSUMING PRODUCTS IN THE HOME

ELECTRIC VEHICLES