

Asia-Pacific Partnership on Clean Development and Climate



Asia Pacific Partnership
United States of America
Power Generation Task Force
August 13 – 17, 2007

HydroVision
Electrical Engineering Components

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Hydro Engineering

HydroVision – Electrical Aspects

Due to age and obsolescence, most electrical equipment was either rehabilitated or replaced:

- Power equipment
- Protection
- Control
- Instrumentation



HydroVision - Generator Rewinds

Higher capacity to match new turbine capability



New stator core steel for greater efficiency

HydroVision - Generators

- Rotor Field Winding Re-insulation



HydroVision - Generators

Added air filtration



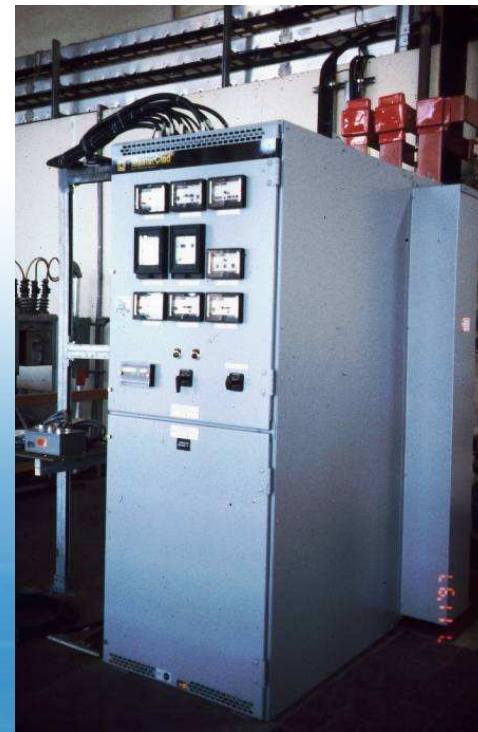
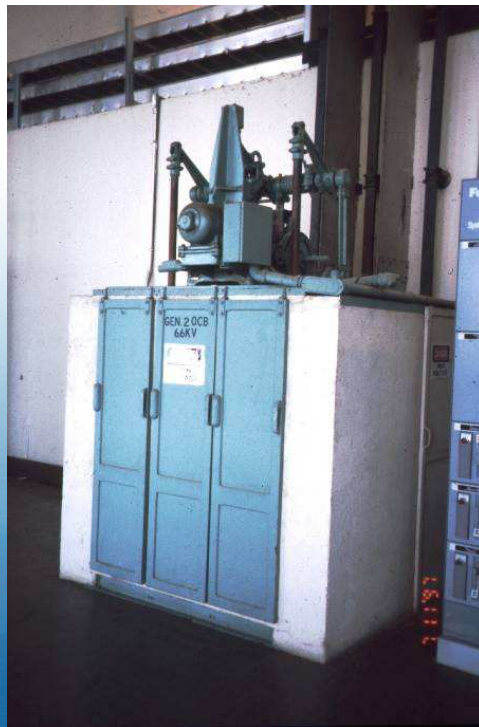
HydroVision - Excitation

- Replaced rotating exciters and rheostats with static excitation systems



HydroVision – Generator Breakers

- Replaced original oil filled generator breakers with new vacuum breakers



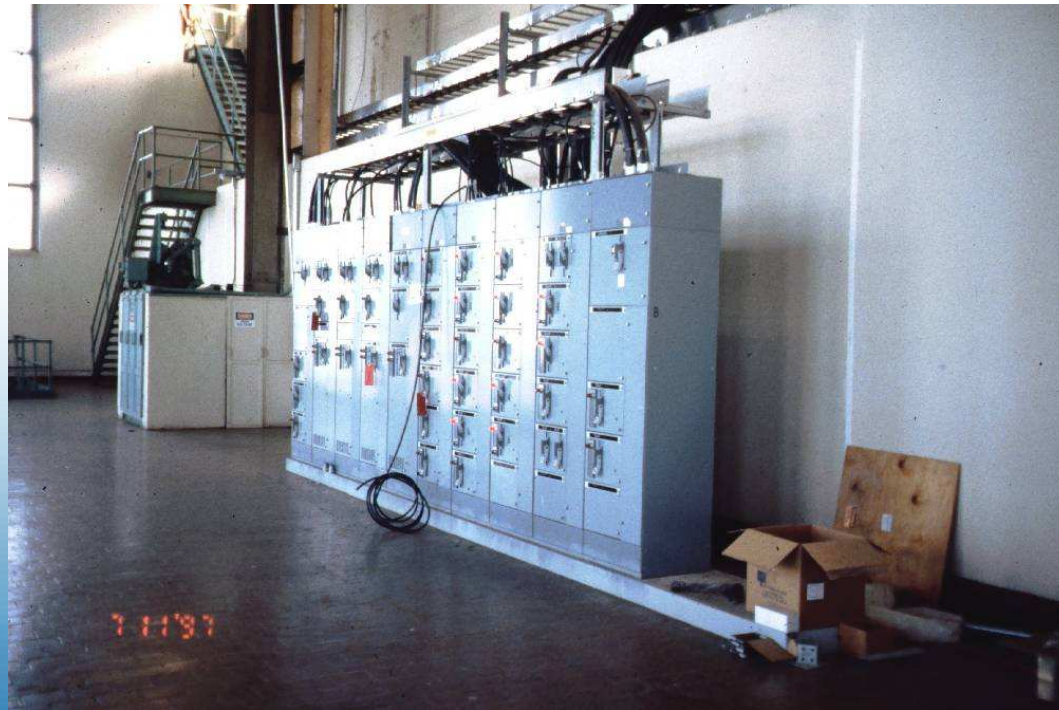
HydroVision – Auxiliary Power

- Replaced original oil filled transformers with new dry transformers



HydroVision – Auxiliary Power

- New power distribution equipment



480 volt AC Motor Control and
Power Distribution Center

HydroVision – Auxiliary Power

- Replaced station batteries (125 volts DC)



HydroVision – Auxiliary Power

- New battery chargers and inverters



HydroVision – Protective Relaying

- Replaced protective relays

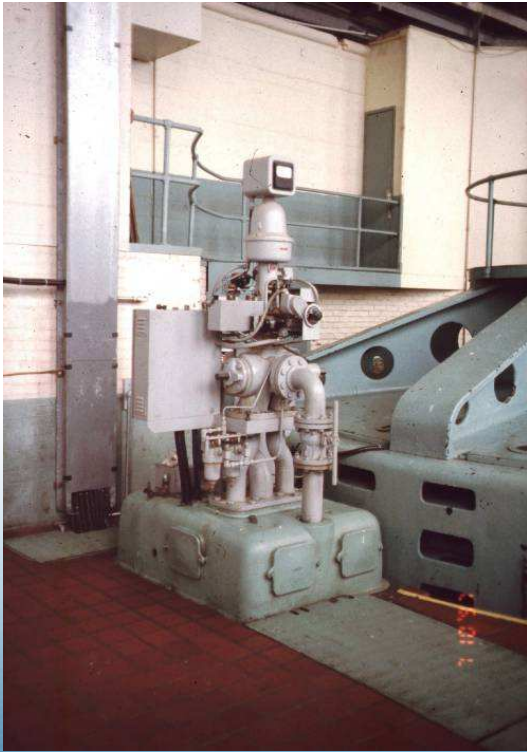


Old Electromechanical Relays



Modern Multifunction Microprocessor Relays

HydroVision – Governor Upgrades



Old Governor

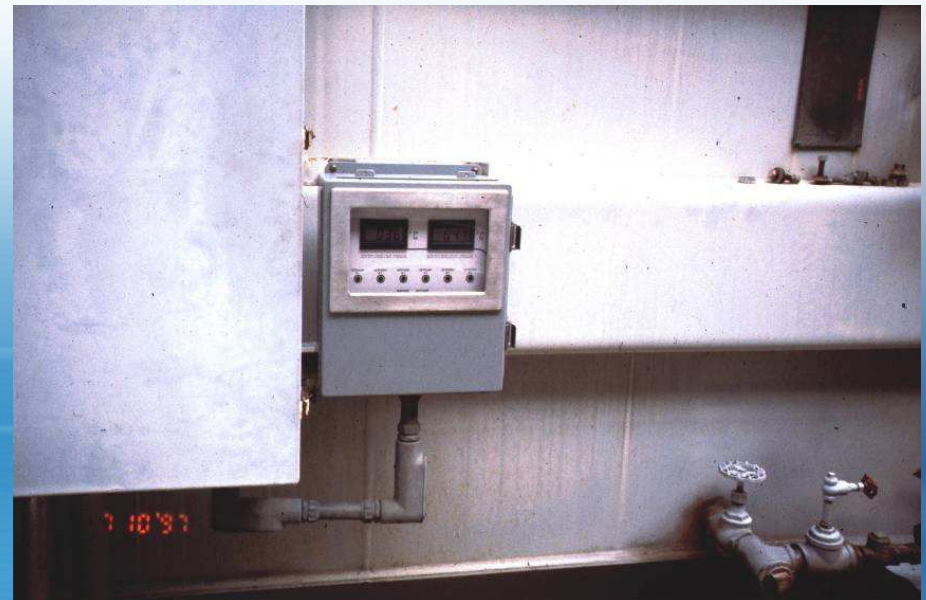


New Governor
Oil Pumping Unit



Unit Control Cabinet
(Programmable Logic
Controller incorporates
all unit control as well as
governor logic)

HydroVision - Instrumentation Upgrades



HydroVision – Control Upgrades



Old control boards

New operator interface to digital control system



HydroVision – New Control Screens

