B-8 Station Service Control Replacement, $105,200

Q. Describe the circumstances, including the costs of replacement and the effect on reliability of the replacement of the PLC's inverter in September 2003.

A. At 21:07 hrs. on September 18,2003 the inverter supplying the Station Service PLC (Programmable Logic Controller) failed resulting in a loss of power to the PLC and a trip of the breaker supplying the Station Service for Powerhouse No. 1. The inverter loss also prevented the station service from transferring to the supplies from Units 1 and 3. Bay D'Espoir had 5 units online supplying approximately 300 MW of the 712 MW system load. Unit 5 tripped first due to low governor oil pressure followed one minute later by Units 2&6. This resulted in a generation loss of 150 MW with an underfrequency loadshed of approximately 150 MW. Units 1&3 tripped 19 minutes later with another 150 MW loadshed.

The Automatic Station Service transfer scheme is dependent on the PLC and its inverter supply. If the inverter is lost the breakers can be switched manually but generation loss could result before an alternate supply is provided.

The cost to replace the inverter in 2003 was $13,200.