Q. **Reference: Refurbish Generation Unit – Snook's Arm, Volume I, Section D, Page D-50**

"The unit at Snook's Arm has been de-rated since 2008 due to a failure on the braking mechanism on the unit (called the Giljet) in conjunction with an issue with the alignment of the machine. The unit has since been realigned and the Giljet repaired, however the unit will still only reach 500 kW of production, not 560 kW as on the nameplate. This de-rating is a result of many components of the machine reaching the end of its useful life. In this current state, there is a need to perform major rehabilitation work to ensure Snook's Arm can safely and reliably produce energy."

What components of the machine have reached the end of their useful life? Provide a list identifying the components and whether or not they are currently working.

A. A list of components that have reached the end of their useful life and their working status is provided in Table 1.

Table 1

Component	Status
Turbine	
18" Runner Stainless Steel Forging	Working but can't be repaired anymore
Chamber facing (large)	Working but badly worn
Chamber facing (small)	Working but badly worn
Wicket Gates	Working but badly worn
Wicket Gate Top Bushings	Working but badly worn
Wicket Gate Bottom Bushings	Working but badly worn
Discharge Bend	Working but had erosion damage
Top Chamber	Working but badly worn
Wicket Gate Links and Bushings	Working but badly worn
Giljet	
Giljet Nozzle	Working but badly worn
Giljet Spear Tip	Working but badly worn
Giljet Spear Rod w/connector	Working but badly worn
Giljet Spear Rod Support	Working but badly worn
Bearings	
Turbine Bearing Thrust Ring & Journal	Working but badly worn
Turbine Bearing Surge & Journal	Working but badly worn
Turbine Bearing Left Thrust Pad Set	Working but badly worn
Turbine Bearing Right Thrust Pad Set	Working but badly worn
Main Inlet Valve	
Butterfly Valve with actuator	Working but badly worn
Dismantling Joint & Flexible Coupling	Working but badly worn
Controls	
Control Panel	Working but worn and outdated
Switch panel & circuit breaker	Working but worn and outdated
Contactor panel	Working but worn and outdated

The unit was in operation, with deteriorated components, at the reduced capacity of 500 kW until July 3, 2014. At that time it was forced out of service due to the exciter end bearing overheating. A new bearing has been manufactured. It will be installed and the unit returned to service by early November 2014 at an estimated total cost of $2,500.