IGS Planned Uprate Projects

1. High Pressure Turbine Retrofit:
   The high pressure turbine on each unit at IGS is scheduled to be replaced with a current technology, high efficiency turbine. This unit will increase high pressure turbine efficiency from approximately 84% to over 92%. Additionally, the turbine will be sized to provide up to 4.5% additional output.

2. Cooling Tower Performance Upgrade:
   The cooling towers on each unit at IGS are scheduled for performance enhancement modifications beginning in 2003 with Unit 1. The enhancements will be designed to support full load operation at 6.9 Mlbs/hr turbine steam flow.

3. Boiler Safety Valve Additions:
   A review is currently underway focused on current boiler safety valve capacity. Addition of one main steam safety valve on each unit is expected in order to address reliability concerns with the existing valves and to accommodate the planned 4.5% increase in turbine output.

4. Generator Cooling Enhancement:
   An engineering evaluation is currently underway to identify any enhancements required on the generator in order to accommodate the planned 8.6% increase in generator output. The anticipated result of this evaluation is an upgrade to the current stator cooling systems.

5. Isophase Bus Cooling Enhancement:
   An engineering evaluation is currently underway to identify any enhancements required on the 26kv generator electrical bus feeding the main step-up transformer. The anticipated result of this evaluation is an upgrade to the current isophase bus duct cooling systems.

6. Large Motor Bus Loading Equalization:
   An engineering evaluation is currently underway to equalize the loading between the large and small motor buswork at IGS. Due to limited tap adjustment capability on the auxiliary transformers feeding these load centers, several motors must be moved from one supply to the other in order to maintain required motor terminal voltages as unit output is increased.

7. Boiler Feed Pump Performance Upgrade:
   The boiler feed pump manufacturer has notified Intermountain of several enhancements they now offer that address previous reliability concerns and allow for small increases in output. These include, improved bearing housings, flow path smoothing, and impeller clearance modifications. These modifications provide for increased pump output at acceptable reliability levels.

8. Main Step-up Transformer Cooling:
   The step-up transformers currently run close to their nominal temperature ratings on the hottest few summer days. These modifications are directed at increasing the cooling system capacity for cooling the transformer oil and frame.

9. NOx Reduction Project:
   Recent advances in the burner industry have resulted in published operational data showing NOx in the 0.20 lbs/MMbtu range. Within this project, burners in Unit 1 would be replaced first in 2003. Following successful testing, Unit 2 would follow in the successive 2004 outage.

10. Scrubber Wall Ring:

Scrubber wall ring technology has been developed and patented in recent years to address inefficient flow patterns that routinely develop within the absorber vessels. This ring would be installed within all twelve (12) scrubber absorber vessels to move flow back to the center of the vessel, providing more efficient scrubbing of the gas.

11. Generator Stator Cooling Water Oxygen Monitoring System:

Given concerns in recent years regarding the long term integrity of the generator stator bars, an oxygen monitoring system, capable of early identification of stator bar degradation is essential. As load increases, stator bar temperature and cooling flow velocities are also expected to rise. This system will guard against unexpected degradation of the stator.

12. High Pressure Heater Drain Line Modifications:

An existing resonant vibration occurring in the high pressure heater drain line to the deaerator has become an increasing concern. The vibration appears to increase with load. An increase in unit output would required a modification to eliminate this concern.

13. Boiler Modifications:

A comprehensive study is currently underway with the manufacturer of the boilers at Intermountain (Babcock & Wilcox). This study has been designed to review all aspects of boiler operation at the new turbine output levels. This study includes evaluation of current technologies and operating practices for minimizing emissions. The study will provide recommendations for modifying the existing boilers for stable and efficient operation at the new higher rating.

14. Circulating Water Makeup Modifications:

In summer months, current circulating water makeup capacity is inadequate. If it were not for nighttime reduced evaporation rates, the existing system would be inadequate at current full load levels. The new design will support the increase makeup requirements and return a degree of redundancy to the system, as originally designed.

15. Cooling Tower Transformer Capacity:

The transformers feeding the cooling tower fan motors have reached their design capacity. Further increases in electrical load would encroach on design redundancy margins. A study will be performed to identify and resolve the required redundancy issues for operation at the new output levels.