The objective of our project was to analyze the cost and feasibility of adding generation to Avista’s current power transmission system. Avista is required to study all proposed modifications to the system and assess their potential influence in order to meet the future energy needs of customers. The scope of work involved learning the power system modeling software, PowerWorld Simulator, and using its extensive testing suite to validate our findings.

**Data Analysis**

- **Transmission Line Cost (approximate $/mile)**: 115 kV ($400K), 230 kV ($1M)
- **Transformer Upgrades**: 115/230 kV ($3M), 230/500 kV ($6M)
- **RAS** – Remedial Action Scheme
- **AGC** – Automatic Generation Control
- **AVR** – Automatic Voltage Regulation
- **NERC** – North American Electric Reliability Corporation
- **FERC** – Federal Energy Regulatory Commission
- **WECC** – Western Electricity Coordinating Council

**Impact Analysis**

- **Ethical** – High voltage transmission is potentially dangerous; studies must deem projects safe
- **Economic** – Proposed solutions must be efficient due to significant cost of system equipment
- **Environmental** – New equipment to the system may physically interfere with existing infrastructure
- **Global** – Added generation cannot cause major blackouts to the electrical grid
- **Societal/Cultural** – Ensure customers energy demands are met

**Future Work**

- **Further Transient Stability Testing**
- **More extensive Power Voltage (PV) analysis**
- **Continue to lower cost estimations**
- **Find more RAS to eliminate unnecessary upgrades to the system**
- **Analyze all four station generators in one model**

**Acknowledgments**

Richard Maguire – Mentor

Our team would like to thank Mr. Maguire for the time he spent assisting us over the course of the year. He provided timely feedback and always answered the team’s questions to the best of his ability. Richard was pivotal to the project, and more importantly the whole learning process.

Team Tiger

* See binders below for the detailed analysis of each Station