APPENDIX F

Construction Management

F.1 Construction Management Organization

Starbuck Power Company, L.L.C. (SPC), a limited liability company that is wholly owned by PPL Global, proposes to build and operate a 1,200-megawatt (MW), natural-gas-fueled, combustion turbine power plant. The current SPC management team consists of President Robert Burke, Vice President Don Fields, and contracted Project Manager Mike Elmer.

SPC will enter into a fixed-price turnkey contract for the engineering, procurement, and construction of the Starbuck Power Project (SPP). The list of potential turnkey contractors for the project will be determined in the fall of 2001. SPC will provide an overall construction management team responsible for overseeing all onsite construction activities associated with the generation plant, excluding the gas lateral and metering/regulatory station (M/R station). An organization chart illustrating the construction management team structure is provided in Figure F-1.

General roles and responsibilities for SPC's construction management team will be as follows:

- **SPC Project Manager**: Review all design work and ensure compliance with health and safety regulations and requirements during SPP construction
- **SPC Onsite Project Engineer:** Oversee onsite project development and report to the SPC Project Manager
- **SPC Onsite Assistant Engineer:** Oversee most onsite engineering development and provide a contact for associated offsite engineers
- **SPC Offsite Engineers:** Include construction, electrical, structural, and mechanical engineers

F.2 Quality Assurance and Quality Control

SPC's construction management team will be responsible for overall quality assurance and quality control (QA/QC) for the SPP. The team will define the quality assurance objectives and standards, data collection requirements, performance measurements, audit requirements, and QA/QC roles and responsibilities for the various parties involved in the construction.

SPC's construction management team will also define the quality control processes and procedures to be implemented on the SPP, specific quality measurements that will be made, and corrective actions needed to ensure that the constructed project meets the facility design specifications. These responsibilities will include approving construction monitoring equipment, ensuring that needed equipment is functioning and calibrated, and documenting all aspects of the construction. The types of construction activities that will be

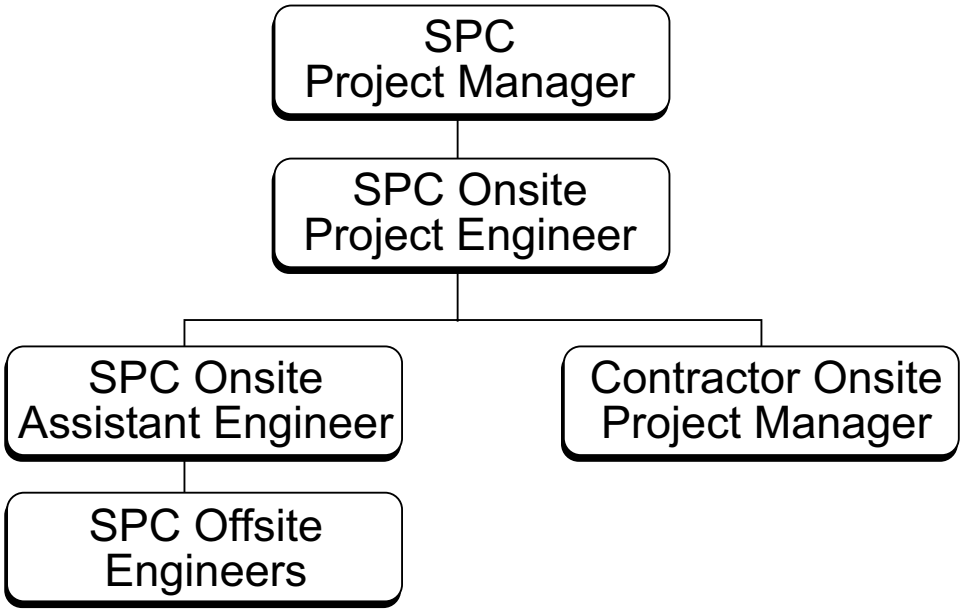

FIGURE F-1
Organization Chart of Construction Management
STARBUCK POWER PROJECT
STARBUCK, WASHINGTON

monitored by SPC for QA/QC purposes are too numerous to fully describe in this appendix. However, typical activities include the locations of buildings, types of equipment provided by the contractor, installation of this equipment, project schedule, and project cost.

Many types of monitoring equipment are likely to be required at various points during project construction. Most of this equipment will be supplied by the contractor, the equipment supplier, or the product manufacturer. It is common, for instance, that a manufacturer's representative be onsite during installation of equipment to ensure that the installation meets specific tolerances required for satisfactory operation. A complete list of equipment is beyond the scope of this ASC but may include surveying devices, pressure meters, flow meters, current and power meters, nondestructive testing devices, and data loggers.

F.3 Construction QA/QC Program

The selected construction contractor will be required to provide a project-specific QA/QC plan to be implemented during construction. SPC will generally hold the contractor responsible for the means, methods, techniques, sequences, and procedures of construction. The contractor's QA/QC plan will address these core responsibilities.

The QA/QC program that the contractor provides to SPC will describe the internal responsibilities and actions that will contribute to the SPP being completed using quality workmanship. In its QA/QC program, the contractor will also indicate measures to be taken to ensure compliance with environmental regulations and health and safety requirements throughout all construction stages. The contractor will identify and provide a properly trained individual to oversee all aspects of health and safety throughout the construction project. SPC's project manager, onsite project engineer, and other associated engineers will review the contractor's QA/QC program and participate in field construction activities to ensure compliance with the program and SPC quality concerns.

F.4 Control and Monitoring Plans QA/QC

SPC's construction management team will require the selected construction contractor to review and implement all procedures or guidelines presented in control and monitoring plans, including the Spill Prevention and Control Plan, the Stormwater Pollution Prevention Plan, Emergency Plans, and the Cultural Resources Monitoring and Mitigation Plan. SPC engineers will witness implementation of the plans by being involved with certain construction activities. Additionally, SPC will review spill reports, observe erosion control performance, and actively participate in cultural resource mitigation if such actions become necessary.

F.5 Equipment Quality Assurance/Quality Control

All equipment installed by the contractor will meet or exceed the operational specifications designated by SPC. A process of checks and reviews will ensure that all equipment will function as engineered in the design of the facility. Corrective measures and the associated

retesting will be conducted for equipment that does not meet contract specifications prior to facility operation. SPC engineers may be involved in certain construction activities and equipment installations, to inspect and accept the installation methodology.

Checks and reviews of facility equipment will be implemented by SPC prior to installation. For each piece of equipment identified in Table F-1, a corresponding level of QA/QC action is indicated. The level of QA/QC action required is dependent upon various criteria. These criteria include, but are not limited to, the equipment's significance to plant operation, its risk to workers' health and safety during malfunction or failure, and the complexity of the equipment's fabrication and assembly.

TABLE F-1
Level of QA/QC Action for Specific Equipment

Equipment Description	Level of Action (see Section F.5)
AC/DC Panelboards	1
Automatic Generation Control System	1
Backflow Preventors	1
Battery, Chargers, UPS	2
Cable Lugs/Termination Equipment	1
Cable Tray and Fittings	0
Cable, Control	1
Cable, LV Power	1
Cable, MV Power	1
Cable, Specialty	1
Cable, Instrument and Thermowell	1
Carbon Dioxide Storage	1
Cathodic Protection	1
CEM Equipment	1
Chemical Feed Equipment	2
Circuit Breakers	1
Compressed Air Equipment	2
Condenser	3
Condenser Air Removal Equipment	1
Cooling Tower	2
Desuperheater	1
Distributed Control System	2
Ductbank and Conduit Materials	1
Electrical Construction Commodities	1
Environmental, Oil/Water Separator	1
Environmental, Selective Catalytic Reduction Unit	3
Environmental, Steam Blow Silencer	1
Expansion Joints	1
Fire Hydrants	1
Fire Protection Systems	1
Flexible Hoses	1
Freeze Protection	0
Fuel Gas Filter/Separator	1
Fuel Gas Heaters	2
Gauge Glasses	1

TABLE F-1
Level of QA/QC Action for Specific Equipment

Equipment Description	Level of Action (see Section F.5)
Generator and Transformer Protective Relay	1
Generator Breakers	2
Generator Term Equipment	2
Generator, Combustion Turbine	3
Generator, Steam Turbine	3
Generators, Heat Recovery Steam	3
Grounding Rods and Cable	1
HRSG Stack	1
Hydrogen Storage	1
Indicators	1
Instrument Racks and Enclosures	1
Insulation and Lagging	1
Junction Boxes	0
Laboratory Furniture	1
Level Transmitters	1
Lighting Equipment	0
Lighting Protection	1
LV Motor Control Centers	2
Maintenance Bins and Shelving	1
Misc. Controls	1
Misc. Instruments	1
Misc. Switches	1
MV Switchgear and Enclosures	2
Nitrogen Storage	1
Office Furniture	1
Pipe Accessories	1
Pipe Supports	3
Pipe, Concrete Circulating Water	1
Pipe, HP Fabricated	3
Pipe, LP Fabricated	3
Pipe, Steel Circulating Water	1
Piping, Nonmetallic	1
Piping, Small Bore	0
Piping, Underground Metallic	1
Pre-engineered Buildings	1
Pre-operation Cleaning Services	1
Primary Flow Elements	1
Pull Boxes	0
Pumps, Boiler Feed	3
Pumps, Circulating Water	3
Pumps, Condensate	3
Pumps, Fire	2
Pumps, General Service	1
Pumps, Sump	1
Raceway Materials	1
Regulators, Self Contained	1

TABLE F-1
Level of QA/QC Action for Specific Equipment

Equipment Description	Level of Action (see Section F.5)
Sanitary Lift Station	1
Secondary Unit Substation	2
Security Systems	1
Service Water Treatment Pressure	1
Sight Flow Indicators	1
Space Conditioning Equipment	1
STG Fixator	1
Steam Blow	1
Steam Exhaust Heads	1
Steam Traps	1
Strainers	1
Structural Steel	3
Substation Control and Protection Equipment	2
Substation Erection	1
Substation Structures and Equipment	2
Substation Transformer	2
Switches	1
Tanks, Fiberglass	1
Tanks, Field Erected	3
Tanks, Shop Fabricated	2
Tanks, Wash Water Drains	1
Thermocouple Assemblies	1
Transformers, Dry Type	1
Transformers, Generator Step-up	2
Transformers, Unit Auxiliary	3
Transmission Line Erection	1
Transmission Line Insulator and Hardware	1
Transmitters	1
Tubular Steel Structures	1
Turbine Room Cranes	1
Valve, Extraction Steam Non Return	1
Valves, Ball	1
Valves, Bronze	0
Valves, Butterfly (24” and Larger)	1
Valves, Butterfly (Less than 24”)	1
Valves, Cast Iron	1
Valves, Forged Steel	1
Valves, General Application Control	2
Valves, HP Cast Steel	2
Valves, LP Cast Steel	2
Valves, Safety and Relief	2
Valves, Steam Drain	1
Valves, Steam Turbine Bypass Control	2
Water Quality Control System	1
Welding Receptacles	0

F.5.1 Level 0 QA/QC Action

- Review all equipment in the field.

F.5.2 Level 1 QA/QC Action

- Telephone, fax, or e-mail the supplier within 1 week of mailing the equipment order request to verify that the order was received, establish a point of contact, and define delivery dates.
- Continue to contact the supplier at least every 2 weeks to expedite the submittal of documents and confirm that the supplier is on schedule for delivery.
- Increase the frequency of contact with the supplier if there appears to be a problem.

F.5.3 Level 2 QA/QC Action

- Implement the steps described in Level 1.
- Heighten the supplier's awareness of the need to expedite engineering submittals. Engineering disciplines will ensure that the supplier understands the required submittal needs and priority.
- Schedule shop visits as necessary, based on the supplier's apparent ability to perform.

F.5.4 Level 3 QA/QC Action

- Implement the steps described in Level 1 and Level 2.
- Schedule a visit to the supplier at the time the initial engineering/procurement/ construction schedule is due. Meet with the supplier, assigned project team, or responsible individual. Review the schedule with the supplier at the shop to verify that scheduling for outside purchases, fabrication lead times, packaging, shipment lead times, etc., will meet the contract requirements.
- Confirm whether the supplier is using a subvendor to supply any material. If so, determine when the supplier will be issuing purchase orders to the subvendor, find out the subvendor's location and contact information, and verify the subvendor's level of experience in manufacturing the equipment or material.
- Tour the supplier (and subvendor) facilities to determine whether the shop is organized and well-run or unorganized and disorderly. Verify the current shop workload and confirm where the needed contract work falls into the schedule (verification of shop loading will include the demand planning, capacity planning, manufacturing resource planning, and manpower planning). Verify the shop loading for all subvendors and confirm where the needed contract work falls into the schedule. Complete the "Supplier Shop Visit Checklist" for the project.
- Before leaving the shop, schedule follow-on visits to the supplier or subvendor as needed, based on milestones on the production schedule. Schedule additional visits as necessary, based on the supplier's apparent ability to complete the contract on time.

- If necessary, put a full-time or part-time person in the supplier's shop until the contract is completed.

F.6 Stop Work Authority

SPC's Project Manager and Onsite Project Engineer shall have overall stop work authority on the SPP. Stop work authority may be used for a number of reasons, including identification of unsafe working practices, failure of the construction contractor to achieve compliance with the environmental standards established for the SPP, unforeseen onsite conditions, poor quality construction, staff and equipment scheduling problems, payment concerns, and other factors. SPC's authority to exercise its stop work rights will be clearly identified in the contract documents for this project.

Stop work orders can be issued that apply to a range of events, from a single activity in a specific location of the construction site to a full stop work order affecting all activities and staff at the project. In general, the decision to exercise stop work authority is usually the owner's prerogative. Examples of situations in which the SPC may exercise partial or full stop work authority include a serious injury accident or fatality, repeated violations of safety standards by the general contractor or a subcontractor, an uncontrolled spill of potentially hazardous materials, failure of a contractor to pay lower tier subcontractors, or a general concern regarding the ability of a contractor to complete required work on time and on budget.

It is understood that standards related to stop work authority may also be defined in the approved ASC. If these are identified, they will be included in the contract documents for construction of the project.

If a sitewide stop work order is declared, all construction workers will be notified immediately and construction activities will cease. Agencies or organizations affected by the cessation of work will be contacted for possible consultation. Such agency contact could occur if SPC were to discover archaeological artifacts during construction, in which case the Washington State Historic Preservation Office (SHPO), Bonneville Power Administration, Energy Facility Site Evaluation Council (EFSEC), and local tribes might all be contacted. Similarly, if SPC were to identify any sensitive plant or animal species onsite, the Washington Department of Ecology and U.S. Fish and Wildlife Service would be contacted.