

A SUPPLIER PERSPECTIVE ...

The Long Term Service Agreement ... A Partnership for Profitability

by Giovanni Salerni, Nuovo Pignone

With increasing frequency, customers are delegating to equipment manufacturers (OEMs) the operation and/or maintenance of their plants (cogeneration plants, industrial plants, compressor stations, pipelines, re-injection stations, platforms, refineries, etc.) with the goal of maximizing profit and minimizing risk.

The several contracts awarded to OEMs are typical examples of this activity where customer and supplier work together to attain common objectives, sharing risks and rewards, working in a sort of partnership in order to benefit from the same common objectives ... power delivered, or gas transported or re-injected.

Increasingly fierce competition in a deregulated market is pressuring energy suppliers to lower operating costs while simultaneously keeping their plants at maximum efficiency. For this reason, suppliers often prefer to concentrate their efforts on their core business, delegating to specialized companies the maintenance and in some cases even the operation of their plants. In many cases the manufacturer of the plant is the best partner for this purpose, due to the specialized knowledge it has acquired during the design and construction of the plant itself. To offer customers all the services they may need, OEMs have organized themselves to be present in the market not only as manufacturers of machines and plants, but also as suppliers of related services such as those of operating the machines and providing for their maintenance. Global service activities include the so called Long Term Service Agreements (LTSAs) which usually last several years and offer the customer five main benefits:

1. The customer knows in advance how much maintenance will cost, eliminating uncertainty;
2. The cost of maintenance can be linked exclusively to the annual production level (kWh for power generation plants, cubic meters of gas handled for gas compression stations, etc.);
3. Maximizing production is the common objective of both customer and manufacturer, and both are recompensed in proportion to the production level; consequently, the plant will be maintained at highest efficiency and constantly updated technologically, eliminating the risk of obsolescence ... often the OEM shares risks and rewards with the customer;
4. The customer's personnel are kept constantly informed of new technologies introduced into the plant and trained about the equipment and its operation and maintenance;

5. The customer is not obliged to keep and manage a spare parts warehouse with the locking up of capital this implies, and the supplier can benefit by sharing its warehouse and inventory with more than one customer.

Although most LTSAs cover the turbomachinery sector (gas and steam turbines, centrifugal compressors and generators) where maintenance operations require highly specialized personnel, there are also contracts for reciprocating machines which, although of more mature technology, may require the same level of sophistication for particular applications. LTSAs must be adapted to customer requirements, are a customized service for excellence, and are highly diversified. They range from the simple "time and material" approach to complex global service agreements with performance guarantees.

Independent Power Producers (IPPs), for example, usually are concerned only with generating and selling power. This necessitates plants as reliable and efficient as possible. Their personnel, however, may not have a thorough knowledge of production means ... of how their plants should be operated and maintained in order to maximize production and thus profit.

At the other extreme are companies operating in the oil and gas sector, which usually have their own organization for running and maintaining their plants and machines and tend to manage their facilities on their own. Nowadays, they are trying to concentrate just on the running (operation) of their assets, delegating the maintenance to the OEM. They require turbocompressors with high availability and controlled heat rate because it affects production and the cost at which they are able to transport their gas.

Because of the differing needs and circumstances of its customers, the OEM has developed a line of service packages which can be combined in different ways to offer each customer a contract tailored to meet real needs in the most economic way.

Everything necessary to attain customer objectives can be included in the contract or can be part of supplementary services to be paid separately by the customer: manpower, spare parts, tooling, logistics, repairs made during scheduled or emergency maintenance, technical assistance, etc.

To this can be added annual, periodic and predictive maintenance, tools, hoisting and transportation, training of customer personnel, improvements and modifications, supervision of maintenance, emergency calls, periodic inspection, technical support, supply of spares and consumables, remote monitoring, diagnostics, headquarters support and more.

Usually an LTSA gives the customer a Guarantee of Performance such as availability, reliability, maintenance costs, power output, heat rate, back-up lease engine, etc. for several years. The guarantee of performance often includes routine and emergency maintenance to guarantee the correct operation of the plant or compressor stations and to prevent any possible breakdown, failure and/or malfunction or defect which could impair or prevent regular operation.

In conclusion, LTSAs are a response to customer needs. Customers would like to operate together with the OEM, creating and strengthening a strong interconnection leading to a long

lasting "partnership" through an LTSA, rather than establishing a mere customer/supplier relationship with low added value for both.

A THIRD PARTY PERSPECTIVE ...

Risk Assessment and Long Term Service Agreements

*by Ron Natole
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Long Term Service Agreements (LTSAs) have become more common and more popular in recent years, particularly among power generators in an increasingly deregulated and competitive marketplace. Availability and efficiency are the twin goals that are seen to ensure profitability and LTSAs are often looked upon as the means to that end. It is important, however, that both the risks and the benefits of LTSAs be evaluated when making such an important decision. Benefits have been discussed elsewhere; let us look now to some of the risks. Bear in mind, however, that even this discussion is necessarily cursive, and a detailed cost/benefit analysis is recommended before any decision is reached.

WHAT IS INCLUDED and WHAT IS NOT

In the example discussed here, we will look at an 85 MW gas turbine generator. The term of the agreement is usually 10-15 years. LTSAs usually include maintenance and overhaul services, capital parts refurbishment, capital parts replacement, overhaul consumables, availability guarantees and output guarantees. What is not included, but what LTSAs usually require to go through them as the contracted provider, are operations expenses, routine and preventive maintenance and supplies, unplanned maintenance, extra work, and operating under conditions outside OEM recommendations. Some of these services may be negotiated or available as an added cost supplement to the LTSA, but others are not included in the agreement.

WHAT DOES IT COST?

Typical per unit costs are as follows:

Mobilization Fees	\$50K to \$100K
Fixed Fee	\$6K to 15K per month
Unplanned Maintenance Option	\$8K to 20K per month
Fired Hour Fee	\$70K to 150K per Fired Hour
Availability Incentive	\$25K to 200K per year

MW Performance Bonus	\$80K to 400K per year
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OEM parts costs are another important consideration. Hot gas path capital costs for an 80-100 MW machine (blades / buckets / vanes / nozzles) were \$400K to \$600K per set. Now they run from \$800K to \$900K per set. Hot gas path spares for a 150-200 MW machine will run from \$1.5 to \$2.5 million per set. And combustor parts are \$50K to \$150K per set for the older style, and \$450K to \$650K per set or more for the low NOx versions.

POTENTIAL PROBLEMS

LTSAs can give rise to some unexpected requirements because of their complexity and abundance of small print. Some of the things to be on the lookout for include:

- Requirement to use OEM services and parts even for unplanned, extra and "not covered" maintenance.
- Conversions, modifications and uprates may not be included in the costs or the parts and labor annual increase index.
- Unplanned maintenance costs may have incident and annual caps well below the potential risk.
- Unplanned and extra service and parts may not be covered and/or their prices not indexed.
- Outage extensions due to unplanned or extra incidents may not be covered in the availability guarantee.
- And the equipment must operate to OEM specs. That usually means no over-firing, no rapid starts, meeting fuel requirements, meeting water/steam requirements, meeting air requirements, and much more. Failure to comply with OEM specs may bring LTSA coverage into question.

RECENT EXPERIENCE

Producer acceptance of LTSAs have recently been a function of the type and use of the gas turbines owned. For more mature machines (prior to 1990), many power producers believe that the benefits offered by LTSAs are also available less expensively from the aftermarket. For the newer more advanced machines, those using the equipment for peaking are leaning toward Short Term Service Agreements of 3-5 years. For base load equipment of the newer technology, producers are more likely to go with LTSAs. The feeling is that without an LTSA there is almost no chance of getting the high technology parts needed to ensure availability because the aftermarket will not be producing them and LTSA agreements will place non-LTSA customers low on the priority list. As the demand for power generation equipment is met by the OEMs over the next few years, and their emphasis necessarily shifts to repair and maintenance, even these producers may have added options.

SUMMARY

Before signing on to any LONG TERM Service Agreement, is important to remember that LTSAs do not give a firm price for all ten-plus years of the duration of the agreement; that "not covered" costs can be extremely high, particularly for parts; and that a detailed cost/benefit analysis is highly recommended.

THE USER PERSPECTIVE ...

LTSAs ... On the River in New Orleans

*by Terry Morgan
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The Gas Turbine Users Symposium at ASME TURBO EXPO '01 in New Orleans hosted a well attended panel session on "Long Term Service Agreements - Current Performance and Future Trends". Long Term Service Agreements (LTSAs) were defined for the session as agreements offering differential access and/or pricing for services and supplies; preferential access agreements; agreements committing the parties to sole or restricted sourcing of services or supplies; or outsourcing agreements where long term mutual benefits are part of the contract.

Seven panelists represented both the oil and gas and large power generation segments of the LTSA marketplace. Panelists were Terry Morgan -- Terry Morgan & Associates LLC (recently of ARCO Alaska, and Panel Chair); John Platt, Staff Advisor -- BP America (Vice Chair); Armando Carrillo, Project Manager -- Petroleos de Venezuela (PDVSA); Ed Sundheim, International Operations Manager -- GPU Power; Daniel Barpal, Engineering Manager -- Duke Energy North America; Kelly McGrath, VP Operations -- El Paso Merchant Energy; and Doug Williamson, VP Gas Plant Operations -- Calpine. Attendance was over 60 engineers, managers and other user representatives from around the world.

The panel discussed agreements typically offered by gas turbine OEMs and other major third party service providers in the power generation business. Other agreements common in the oil and gas business such as alliance and outsourcing were reviewed.

PRESENTATION

LTSA experience on the panel ranged from preferred supplier agreements to full outsourcing of major gas compression operation to power generation LTSAs for both new generation gas turbines, older GTs, and balance of plant agreements. Panelists commented in four areas: considerations for LTSAs; experience to date; improvement of current agreements; and the future of these agreements.

Reasons to Consider LTSAs. Panelists identified several reasons for considering the use of LTSAs. Among these were:

- Improved performance
- Reduced operating expenses
- Reduced project execution times where EPC services are part of the LTSA
- Management concern that unplanned maintenance of new gas turbine plants is potentially much larger than past experience
- Operator desire to share risk of new technology with OEM
- Alignment of OEM incentives with operator business model
- Preferential access to supplies of high technology parts

Experience To-Date. Panelists' experience to-date showed the following highlights:

- One operator reported a reduction of 25% in Operating Expenses (Opex) and 15% in Capital Expenses (Capex) in an agreement for outsourcing a major compression contract including Engineering, Procurement and Construction (EPC) work
- Several operators reported that well written LTSAs did help align supplier and operator goals for costs and outage performance
- Communication with the supplier at sites with LTSAs was good and frequent
- The agreements create a desire to improve the working relationship on site
- Standardized terms and conditions across operator sites was a major benefit
- For major outsourcing, agreement term should be longer than two major overhaul cycles to allow time to level results and gains/losses especially on large fleets.

Needed Improvements. LTSA agreements have several areas that the panelists feel need improvement:

- Selection of an OEM or particularly a third party supplier with the financial and technical resources to deliver desired results over all business cycles can be difficult
- Supplier experience in actual delivery of contracted performance is seen as suspect in view of the projected power plant construction growth in the U.S.
- Competition is needed - more third party suppliers with adequate financial and technical resources are required
- Long term cost reduction needs more focus by suppliers
- Better techniques are needed to respond to operating profile changes at a given location and renegotiate pricing accordingly
- Concern exists that OEMs are using dedicated LTSA spares to support warranty needs, especially on advanced turbines - parts supply improvements are needed
- OEMs and third party suppliers must demonstrate that contracted parts supply commitments, especially for advanced machines, can be met
- Part design life is a serious issue and has not been "as advertised" nor "as assumed" in the execution of current LTSAs
- Current LTSA forms do not lift any burden from operators and their insurers and do not control costs for risk management services
- Repair technology development is seen as lagging demand for repair service
- Management support for long term use and modification of these agreements is less than desired.

The Future of LTSAs. For the future, panelists predicted the following features and improvements would become part of LTSAs and major outsourcing agreements:

- Benchmarking of industry LTSA performance and better cooperation among operators in benchmarking efforts will become the norm
- Contracts will be easier to modify and will more accurately reflect the real operating environment and business needs of both operator and supplier
- Panelists expressed strong support for third party providers in the LTSA market while recognizing entry hurdles where advanced technologies controlled by the OEMs are used.
- Parts supply will expand - third party providers will be a market factor
- Operators contracting strategy will become more sophisticated as machines age and suppliers broaden - operators will drive the form of the contract

- Operators will selectively contract for elements of work or supply, as their business plan requires.

In those markets where insurance coverage is normally used to guarantee plant operations and allocate risk, panelists saw changes coming to control costs:

- Operators will become more forceful, especially with OEMs, in expecting the OEM to take some insurance risk for new technology offerings
- OEM recommendations to run parts longer than experience dictates or originally contracted will result in negotiated risk sharing to cut insurance costs
- Operators will expect suppliers to assume some risk management burden--including property damage risks - there will be a new look at shared risks and rewards and proper allocation.

DISCUSSION

Attendees and panelists participated in a lively Question and Answer session. Some of the key topics covered were:

- An insurer observed that premiums and deductibles for LTSAs appeared to be going up as insurers see LTSAs as a higher cost service arrangement. Insurers are also concerned with supplier's proposals to split benefits of proposed increases in time between overhaul with the operator. Such agreements can leave the insurer exposed to major coverage risk with no possible reward. This insurer observed that some insurance companies are canceling coverage in LTSA situations. Panelists agreed that it would be appropriate to share risk with the supplier. The panel was also concerned that risk management costs were not being properly shared with suppliers in current agreements.
- On the issue of extending run times in an LTSA or outsourced world, the panel and audience agreed that newer turbine technology has reduced intervals and that more supplier and parts competition is needed. Panelists are convinced that most of the risk in extending run times stays with the operator and it is a challenge to get the OEM to accept adequate risk sharing for extending run times.
- Ancillary or balance of plant equipment can be neglected in an LTSA. Oil and gas operators have had good success outsourcing this work separately from the LTSA by dealing directly with the ancillary equipment suppliers.
- The issue of rotatable spares was discussed. Many felt most comfortable receiving their own rotatable spares back from repair providers. Some major operators believe that OEM repairs transfer the risk of acceptable future life to OEM and are not demanding their parts back. One major user expressed confidence in OEMs to scrap parts if required but was doubtful other previous users would manage parts correctly.
- A lively discussion ensued about the use of Equivalent Operational Hours in LTSA contracts. All of the panelists pointed out differences in how this is handled by each OEM and in some cases site to site. All panelists cautioned that changes in site operating profile could heavily influence costs, parts availability, and supplier ability to respond to outages. A good review of costs versus hours per start was provided. There is a real cost issue between 20 hours/start and 30 hours/start where many plants in the U.S. are now operating.

In the power generation industry, most of the panelists felt that their LTSAs were working in accordance with their individual company situation and expectations. Difficulties were noted in parts access, OEM resources, third party provider access to the advanced turbine market, and with parts repair cycle time.

The oil and gas industry has used the alliance and outsourcing "cousins" of LTSAs for some time and is adept at using the agreements. Oil and gas agreements for turbine maintenance are more selective in scope and cover older, more mature equipment. Agreements for outsourcing of entire operations are becoming more common but are very unique and require flexibility and a clear view of the long-term goals.