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Industrial Advanced Turbine Systems: Development and Demonstration

Quarterly Report
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For
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Disclaimer

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) has initiated a program for advanced turbine systems (ATS) that will serve industrial power generation markets. The objective of the cooperative agreements granted under the program is to join the DOE with industry in research and development that will lead to commercial offerings in the private sector. The ATS will provide ultra-high efficiency, environmental superiority, and cost competitiveness. The ATS will foster (1) early market penetration that enhances the global competitiveness of U.S. industry, (2) public health benefits resulting from reduced exhaust gas emissions of target pollutants, (3) reduced cost of power used in the energy-intensive industrial marketplace and (4) the retention and expansion of the skilled U.S. technology base required for the design, development and maintenance of state-of-the-art advanced turbine products.

The Industrial ATS Development and Demonstration program is a multi-phased effort. Solar Turbines Incorporated (Solar) has participated in Phases 1 and 2 of the program. On September 14, 1995 Solar was awarded a Cooperative Agreement for Phases 3 and 4 of the program (DE-FC21-95MC31173) by the DOE's Office of Energy Efficiency and Renewable Energy (EE). Technical administration of the Cooperative Agreement will be provided from EE's Chicago Operations Office. Contract administration of the Cooperative Agreement will be provided from DOE's Office of Fossil Energy, Federal Energy Technology Center (FETC).

Phase 3 of the work is separated into two subphases: Phase 3A entails Component Design and Development; Phase 3B will involve Integrated Subsystem Testing. Phase 4 will cover Host Site Testing. The cooperative agreement funding is separated into three budget periods. Budget Period 2 runs from November 10, 1997 to June 30, 1990.

2.0 SUMMARY ASSESSMENT

2.1 Estimate at Completion

Forecasts call for completion of the program within budget as originally estimated. Scheduled completion is forecasted to be approximately 3 years late to original plan. This delay has been intentionally planned in order to better match program tasks to the anticipated availability of DOE funds. To ensure the timely realization of DOE/Solar program goals, the development schedule for the smaller system (Mercury 50) and enabling technologies has been maintained, and commissioning of the field test unit is scheduled for May of 2000. The development schedule for the larger system (ATS-L) has been delayed to accommodate the funding shortfall without undue impact to near-term program goals.

2.2 Overall Assessment of Performance

As of the end of the reporting period work on the program is 29.1% complete (24.7% last quarter). Work on the Mercury 50 development and ATS technology development portions of the program (WBS 10000 *et seq*) is 48.9% complete (41.6% last quarter). Estimates of percent compete are based upon milestones completed. In order to maintain objectivity in assessing schedule progress, Solar uses a 0/100 percent complete assumption for milestones rather than

subjectively estimating progress toward completion of milestones. Cost and schedule variance information is provided in Section 4.0 Program Management.

Mercury 50: The detail design of the Mercury 50 engine continues. Design reviews held during the quarter are listed in Table 1.

Subassembly/Component	Type	Date
Turbine Shaft Assembly	PDR	13 January
Catalytic Combustor Manufacturing	CDR	2 February
Centerframe and Tip Clearance	CDR	5 February
Turbine Shaft Assembly	CDR	17 February
Compressor Stator	CDR	17 March
Catalytic Combustor	CDR	23 March
Squeeze Film Damper/Rotor Dynamics	CDR	31 March

Table 1. Mercury 50 Design Reviews

Production and development parts are being received and some machining is being done. Tooling is also ramping up with some 150 tooling orders having been released this quarter. We have the number three bearing housing and compressor diffuser housing are being machined. The exhaust collector/diffuser and the air inlet muff are being assembled by the supplier. The tool proof is proceeding on the center frame. The stages 3 through 7 stator vanes were accepted, and the detail fabrication tooling for these stators is on. Stages 8 through 10 are still being developed and will ship by early May. The first two combustor end covers have shipped to the machine supplier for final machine and pressure test. The first combustor housing is cast and rough machined. It is being first article inspected at the casting supplier and will ship to the final machining supplier by the middle of April. The IGV and the two VGV (Vanes) have been machined and delivered for first articles are in inspection at Solar.

The stage 1 turbine blades have been cast and are going through process development at machining, tip treatment, and coating suppliers. Delivery of the first stage turbine blades has been delayed possible into mid-June. The turbine section continues to be the pacing subassembly.

An increasing number of drawings are being released at levels allowing the fabrication or procurement of hardware (150 this quarter). Of the 358 total drawings required, 295 had been released by the end of the reporting period at a level allowing tooling to be built; 257 had been released at a level allowing fabrication of parts. (Solar design engineers, manufacturing engineers and suppliers work concurrently based upon progressive levels of CPDs rather than working in serial manner based on the formal release of final drawings.)

The base, reduction gearbox and generator for the development unit have all been received. Subassemblies are being built with the fuel module having been completed. The package is expected to be completed in June. Cell installation will begin after the unit is run through pre-test. The cell modification is on schedule and will be ready for the package.

Performance testing on the recuperator core was completed at the Caterpillar Test Center. Thermal performance goals were met with the test core achieving 92% thermal effectiveness.

The full scale ultra-lean premix (ULP) combustion test rig was completed and installed into the atmospheric test facility. Initial data has been run including thermal paint data at temperatures up to 1000°F. The rig will continue iterative testing in the atmospheric facility until the high pressure test facility is ready to accept the rig in mid-May.

The target date for commencing the build of the first engine has been moved from June to the end of August.

A considerable amount of effort is being directed toward production and facilities planning in order to ensure that forecasted production levels may be met. Several alternative scenarios are being evaluated.

3.0 TECHNICAL PROGRESS BY TASK

3.1 Mercury 50 Engine and Package

WBS 11200 - Compressor Section

Compressor Rotor: Stator vane drawings have been re-issued to incorporate minor changes requested by Manufacturing. First article inspections were completed on stages 3 through 7 vanes. A CDR on the fixed stators was completed in March. There were no critical action items resulting from the CDR, and therefore all designs are considered final. Two recommendations from the CDR were to instrument the stators with strain gages early in the engine test program as a risk reduction measure. Prior to the engine test, additional ding-testing of stator hardware will be performed in the laboratory.

Top level rotor assembly drawings are currently being detailed in layout. All disk and spacer drawings have been released to Manufacturing for hardware procurement.

1st and 2nd Stage compressor blade first article reports from the supplier have been received. Evaluations have been completed with no issues to report. Parts are currently going through acoustic, holography, and fatigue testing at Solar as part of the first article evaluation. Stages 3 through 10 blade castings have been completed, first articles completed, and parts sent to the machining supplier. Variable guide vane castings are complete for the IGV and stages 1 and 2. Machining is underway.

Compressor Static Structures: All major support structure castings have been delivered to Solar. Machining has started on the #3 bearing housing and the compressor discharge housing.

Drawings for the #1 and #3 bearing oil tubes have been released to fabricate these parts. These are the tube interfaces between the center frame and the bearing housings. The top assembly drawings for the air inlet/bearing housing and the compressor diffuser have been released. All detail drawings for the compressor section have been released to Manufacturing. Work is in progress on the data chart and instrumentation drawings.

Variable Guide Vanes: The drawing for the VGV actuation arm has modified, and the supplier will revise tooling accordingly. A layout is in the final stages of completion to define the vane alignment tool that is needed for the 1st engine. Support will be required from the Tooling department for completion of the details.

Three designs have been proposed for the guide vane covers, and the drawings are at different stages of completion.

Hardware for the IGV inner arrived for three complete matched sets. The units were disassembled and reassembled to check the ease of assembly. The assembly process is simple and in line with expectations. Two more rings are being machined and are nearing completion

WBS 11300 - Combustion System
WBS 11500 - Fuel System

ULP Combustion System: The first combustion liner was assembled and tested on a cold air flow test bench to check out the actual air distribution against that of the design intent. It was found that some of the impingement cooling holes had a higher discharge coefficient than expected and that the pressure loss caused by the turbulators was only 50% of the design intent. The reason for these differences is not yet known. The required air distribution was achieved by adjusting the flow into the dome and reducing the number of impingement cooling holes.

The first full set of injectors was produced and their performance individually checked out on the single injector combustion rig. Their performance was consistent with expectations based on testing of the prototype injectors.

WBS 11400 - Recuperator Section

The Mercury 50 recuperator design was completed. All Mercury 50 recuperator drawings were completed by mid-March. The vendor-supplied slide mount items were ordered and received for the first four engine builds (eight slide mounts). The mechanical installation drawing was competed and the database given to Packaging for integration into their model.

The performance test was completed at Caterpillar Tech Center in late December and the data were analyzed in January. The aggressive thermal performance goals were confirmed in test with a 100-cell test core achieving the predicted 92% thermal effectiveness. Pressure losses were also reasonably close to predicted values.

The first recuperator is currently being manufactured in Channelview, Texas. All material was folded and crushed and all cells were welded on the robotic weld systems. A leak test testing line was set-up for leak testing air cells. The recuperator core is typically manufactured in Aquarters@ and four completed quarter cores are assembled into a full-sized core. At the end of

March, the first quarter core was completed (stacked and welded) and the 2nd quarter core was 25% complete. The target delivery of the recuperator core to the Kearny Mesa test cell is scheduled for the middle of May. The expansion joint assemblies, specifically the compressor to recuperator interface piping and the recuperator to combustor housing expansion bellows were ordered and received.

WBS 11600 - Turbine Section

The turbine design effort is progressing well, with 32 of the originally planned 33 design reviews completed. The remaining CDR involves the turbine nozzle case, which is currently one of the principal pacing areas of the overall engine. The turbine status improved significantly during the quarter with completion of detailed design of several critical areas. For example, the center frame/turbine case analysis and CDR were completed, which has raised the confidence level of this unique new design concept. Other important CDR's include the rolling element bearing and turbine shaft reviews. Many critical questions were answered in these design reviews, as well as identifying areas of risks which must be recognized during build and testing of the initial evaluation units.

Sliding Ring Sealing: Sealing arrangements for the sliding ring and diaphragm components were finalized. The components will incorporate an E-seal type design. The manufacturer of the seal was closely involved in the design. Analysis showed deflections of the seal are acceptable for the application.

Turbine Rotor: Design of the first stage blade and disk components/assembly were completed in January. The drawings were released and disk forgings for the first engine are being machined. First stage blades have been cast, with several casting quality issues being addressed by Solar/Howmet. The result has been an improvement in blade tooling points for machining, with delivery expected to support first engine build.

A preliminary three dimensional thermal analysis of the 2nd rotor and shaft assembly was completed. The study included the rotor thrust balance arrangement, which uses compressor discharge air (PCD) in a pressurized cavity to offset the axial thrust load. The pressurized cavity incorporates a rotating labyrinth-type seal. The preliminary analysis shows the natural leakage of PCD air past the labyrinth seal is acting as an unexpected cooling source of the second stage rotor causing it to run cooler than previously calculated, which allows some flexibility in material selection.

Center Frame Design: Transient and steady state tip clearances have been calculated using a sophisticated finite element model developed by the Turbine Team. The technique aids in exploring variables such as the influence of start time on transient response of the system, as well as turbine shut-down and post lube scenarios. Stress analysis of the center frame assembly was also completed. Thermal and mechanical loads during start transients are the main stress drivers.

Results of both the tip clearance and center frame analyses were reviewed in a CDR in early February. The CDR concluded that the basic center frame concept was sound and should be carried forward to development engine testing. The analysis revealed that the steady state tip clearance was greater than initially assumed due to the current uncooled nozzle case design. It was decided to retain the uncooled case for the first build of the engine despite the hit on

efficiency. A path has already been identified for improving the clearance situation via a cooled nozzle case approach which will be introduced as quickly as possible in subsequent builds.

WBS 12110: Generator

The 1st build test package generator from Ideal was delivered in late March. Generator rating for 1st test package is 4160 Volts, 60 Hz with insulation Class F rated temperature rise.

WBS 12130: Electrical Conduit / J-Boxes

The package J-boxes with support brackets have been designed and fabricated for the 1st build test package. The main control and display boxes as well as the DC control box and J-boxes for the proximeters and chip detector has been assembled to the package.

WBS 12140: Package / Generator Frame

The frame for the 1st build test package was completed by Solar's Turbofab facility in Channelview, Texas and delivered to Kearny Mesa for assembly in early March. A vibration and deflection test was conducted on the frame to validate the mechanical design. The test was performed with static load weights applied to the generator pad, gearbox, engine trunnion pad and recuperator support pad areas. A total of weight simulating a complete package was applied to the frame. The results of the vibration and deflection test on the development frame were found to be acceptable with some minor rework required for stiffening the frame floor pan areas and bulkheads.

Proposals have been requested from the generator suppliers for a common frame size for all voltages. The goal is to have one frame size from each generator supplier that will be common to one package base design. The proposals should be received by mid-April.

WBS 12150: Enclosure Assembly

Mercury 50 Marketing and Mechanical Design groups continue to refine the enclosure design strategy. Marketing requested that the enclosure engineering group look at three standard options for the production design. The enclosure design team will enhance the Mercury product goals relative to low cost, efficiency, emissions reduction, size and weight; ease of connection and start-up; reliability and maintainability.

WBS 12160: Inlet Filter / Silencer / Ducting

The inlet duct design was reviewed by the turbine compressor engineering group and the drawing released in January for vendor fabrication to support the 1st test package build. Delivery of the inlet duct for the 1st package is expected in early May. The silencer drawing was also released for vendor fabrication and delivery is expected by April.

WBS 12170: Recuperator Support

Fabrication of the recuperator support structure was completed by Solar's Turbofab facility. The structure has been assembled complete to the 1st test package.

WBS 12210: Control Console

Electrical drawings including schematic, wiring diagram, and package / console interface have been released to support fabrication of the 1st test unit. Control panel fabrication began in March and completion is expected by mid April. Testing of panels will be complete by May and will be ready to assemble on the package.

Control software is progressing and will be ready for simulation testing in April.

WBS 12220: Package Lube Oil System

Lube system components have been assembled to the 1st test package. A complete lube system flushing will be conducted prior to moving the package to the test cell area. The oil to be used for the Mercury test package will be per MIL-L-23699. A dedicated Mercury flushing rig cart will be procured to ensure there is no mixing of different oil products..

WBS 12230: Package Fuel System

Sub-assembly of the development fuel module was completed in February and has been installed on the 1st test package. Efforts are underway to design the "production model" fuel system.

WBS 12240: Package Start System

Direct AC start motor and variable frequency drive (VFD) have been procured and are ready for package assembly.

WBS 12300: Package Build

1st build test package assembly began in early March with base frame arrival from Solar's Turbofab facility in Texas. The gearbox; fuel module; lube system components; recuperator support structure, and electrical control boxes have been assembled to the package. The Ideal generator arrived on March 30 and will be assembled to the package next.

The recuperator assembly is now expected by mid-May from Turbofab. The package wiring will begin in May and will take approximately 2 weeks.

The target date for completion of the 1st test package is early June. After package assembly is complete the unit will be moved to pre-test area for lube system flushing.

WBS 17200 - Balance of Plant

Balance of plant configuration is being optimized. The use of standard modules is emerging as a key component of the strategy. An evaluation of available fuel boost compressor modules for the Mercury 50 balance of plant/scope of supply was conducted. Alternatives to traditional fuel gas compressors are being evaluated.

3.2 Technology Development

WBS 19100 - Advanced Turbine Cooling and Sealing

Airfoil Cooling: Components were fabricated and test sections are being assembled to test the full scale first stage blades and nozzles in the hot cascade rig for final validation of the advanced cooling techniques designed into the Mercury 50 gas turbine.

A rig was assembled and calibrated with pressure sensitive paints in order to optimize the film cooling effectiveness of the Mercury 50 first stage nozzle.

Heat Transfer Augmentation with Dimples: A flow visualization facility to test a large (20 X) scale dimpled section was assembled at the University of Utah. Early results of the study have assisted in understanding the complicated flow phenomena and heat transfer augmentation mechanism in a dimpled channel. A parallel study performed in the Solar liquid crystal painted test section indicated that 220% augmentation of the surface heat transfer coefficient is achievable.

WBS 19200 - Advanced Combustion

Ultra-lean premixed combustion development: Results of CFD runs on injector air and fuel flow fields were received and provided detailed insight into the aerodynamics and gas/air premixing characteristics. Emissions test results obtained on the combustion rig indicate that good premixing is achieved, which is confirmed by the CFD studies. Pressure oscillations are being experienced on both the single injector and annular test rigs, and investigations on the source of and control of the measured frequencies are continuing.

Advanced Combustor Controls: A new CO sensor from Servomex was installed in Solar's Taurus 70 test engine. Readings from the sensor were erratic, and the unit has been returned to Servomex UK. When it is returned, the UK office will send personnel familiar with the sensor to commission it on site in San Diego.

The Rosemount NDIR CO sensor system is operating on the Taurus 70 engine. This sensor is funded by Solar outside the ATS program, but it will provide a back-up system for the Mercury 50 if the Servomex sensor proves inadequate for the job.

Advanced Liner Cooling: The first electrochemically milled (ECM) turbulated 8 inch diameter test liner was damaged during combustion test due to a test rig instrumentation problem. The second, thermal barrier coated, liner is being assembled for test.

A dimpled 8 inch liner has been received and will be built up for combustion test.

An analysis of "pin -fin" cooling suggests that these devices may achieve better cooling performance than turbulators for the same pressure loss. A test piece with a pin-fin pattern was designed for the heat transfer rig and is being manufactured. A drawing was made of the outer wall of the Mercury 50 combustion liner with a pin-fin pattern to allow manufacturing engineers to consider methods to produce this part.

Catalytic Combustion: Primary effort on catalytic combustion has moved from the Advanced Technology area into Mercury 50 design effort. See discussion under WBS 11300/WBS 11500. Instrumentation (pressure/temperature/emissions) for the catalytic combustion test rig builds on the design of the ULP system test rig although a separate rig will be built for the catalytic combustion system.

A contract has been awarded to ASE Technologies to perform modeling of the air flow distribution in three critical areas of the catalytic combustion system: a) combustor inlet plenum; b) premixer inlet; and, c) transition section and turbine inlet. Initial analysis suggests that the differences in air mass flow between the five cans is acceptable (<1.5%). A detailed 3-D analysis of the inlet plenum will be completed soon. Detailed modeling of the premixer inlet has been performed.

WBS 19300 - Ceramic and Composite Materials

Ceramic Nozzle Development: The qualification test for the SN 88 nozzles was completed successfully (CSGT program). A longer term test (100 hours) is planned in the next quarter. These tests will play a key role in the future viability of ceramic nozzles for the ATS "L" engine.

One concern has been the environmental degradation of silicon based ceramics in combustion rich environments. All three candidates for the ATS "L" nozzle, SN 88 silicon nitride from NGK, AS 800 silicon nitride from Allied Signal Ceramic Components and SN 281 from Kyocera, performed very well in exposure tests in a combustor rig. The weight loss after 1000 hours was typically less than 0.5%, which is an order of magnitude less than the weight loss of the ceramic matrix composites tested.

Kyocera's SN 281 has shown the greatest creep resistance of the three silicon nitrides.

Ceramic Tip Shoes: Monolithic porous ceramic tipshoes have been procured from Kyocera and will be tested against both metallic and ceramic blades. A CFCC tipshoe with a less dense surface has also shown promise in knife edge rub tests and will be tested with blades as well.

Ceramic Interstage Seal Ring: Dow Corning's Si-N-C / SiC composite has shown considerable promise in knife edge testing as a seal ring candidate. The low thermal expansion coefficient is the principle source of advantage in reducing leakage. Dow Corning has demonstrated manufacturability of an 8 inch diameter seal ring. Feasibility studies are ongoing.

Continuous Fiber Ceramic Composites: Composite Optics, Inc. (COI) fabricated two Nextel 720 reinforced alumino-silicate subscale combustor liners. Some localized damage occurred to

the first liner when it was removed from the tool due to sticking of the end of the part to the tool. COI fabricated the second part and delivered it to Solar. ANL's inspection of the liners using back-lighting, air-coupled ultrasound and thermal diffusivity imaging showed that both liners have areas of low density. (The NDE work was completed under separate funding.) COI is performing tests on the end trim from the second liner to determine the impact of the flaw on the material's performance. After these evaluations, Solar and COI will decide whether the liner should be tested in the subscale combustor rig.

A meeting was held at COI to discuss ceramic design and ceramic to metal attachment issues. COI also gave an overview of their business and experience with the oxide system which will be tested at Solar.

A meeting was held at ORNL to discuss the progress of the CFCC environmental exposure testing. The objective of the test is to expose coupons to a simulated combustor environment. Several versions of SiC based materials are currently in test.

WBS 19400 - Advanced Turbine Materials Development

Forged Disk Development: The mechanical testing program for P/M U720 is complete, with the exception of long term creep testing. Room and elevated temperature tensile, stress rupture, 0.2% creep, low cycle fatigue and high cycle fatigue properties were all found to meet or exceed expectations. The material also passed Solar's notch sensitivity test.

Dual Alloy Disk Material Development: Sub-scale specimens have been canned and HIP'd at Howmet. A reduced-scope plan for evaluation of the bond line integrity is being developed.

CMSX-10 Blade Development: A material specification for CMSX-10 has been issued. Study and optimization of the heat treatment and coating cycles is underway. Particular attention is being paid to the effects of the cooling rate from solution anneal temperature on gamma prime size and distribution. A study of the coating and substrate life interaction is also in progress.

Low CTE Material Development: A conversion process has been developed for producing 12" billet from a 20" diameter ingot of Haynes 242. This material was used for input to the ring rolling process. Round robin testing of prototype nozzle case material ring rolled from 10" and 12" billet is complete and shows that room temperature tensile and stress rupture properties meet the material specification. However, 1200°F tensile properties fall somewhat below the lower limit of the specification. Although material properties are sufficient for the nozzle case application, further optimization of heat treatment and processing to improve elevated temperature tensile properties will be pursued. Melting and conversion of a 24" diameter ingot is also underway.

Advanced Casting Techniques: A spraycast and HIP'd Haynes 242 preform has been shipped to Doncasters, Ltd for ring rolling. A plan for material property evaluation is being developed.

A preliminary study of vacuum die casting of 17-4 PH compressor blades identified two technical hurdles. The first involves a severe die cracking issue that limits die life and hence jeopardizes cost saving goals. Secondly, material property evaluations show that tensile and high cycle fatigue properties fall below those of investment cast 17-4 PH. A more detailed estimation

of potential cost savings for vacuum die casting relative to investment casting is underway, as is the development of plans to improve die life.

WBS 19500 - Recuperator Materials Development

The goal of developing a material capable of withstanding a stress of 10 ksi at 1200°F for 100,000 hours has been met in laboratory specimens through modification of thermomechanical processing of 347 stainless steel foil. A patent disclosure letter has been prepared. Transfer of laboratory results to an Allegheny Ludlum production rolling mill is underway, and mill-processed foil will be available for evaluation and core assembly in second quarter of 1998. Development of creep and oxidation lifing models for 347 SS foil is nearing completion.

WBS 19700 - Advanced Coating Systems

Thermal Barrier Coatings: Thickness, microstructure and surface profile measurements of thermal barrier coated Taurus 70 stage 1 blades and nozzles were completed. The blades and nozzles were assembled in an engine for durability testing. No major processing issues were recognized for the TBC applied blades; however, the nozzle exhibited some processing challenges. These issues were documented and shared with the coating supplier for process optimization and improvement.

A relationship between cycle time and TBC failure was established. A 10-hour cyclic testing of the Solar Turbines developed plasma sprayed TBC at 2000°F was completed. The TBC failed after 257 cycles. The same coating failed after 50, 100-hour cycles at 2000°F. TBC life almost doubles with longer cycle time.

Thermal cycling of the Solar developed plasma sprayed TBC at 1900°F is ongoing. To date, the coating has survived over 40, 100-hour cycles without failure.

Process and manufacturing assessmenta of abrasive blade tip treatments were completed on Mars stage 1 blades. Tip grinding issues were identified and documented. An experimental effort with different grinding wheels and media was conducted.

Internal Coatings: A final report is in preparation. A coating specification was drafted and is in the review cycle before release.

Alloy Coatings: CMSX-10 coated specimens were received from Chromalloy NY (CNY). The specimens were coated with a modified Pt-Al developed by Chromalloy UK (CUK). These specimens are to be used to validate the coating technology transfer from CUK to CNY.

The coated specimens were included in the oxidation test matrix. One coated specimen was metallographically analyzed for coating microstructure, chemistry and thickness. The CNY coating was identical to the coating initially tested and supplied by CUK.

Mercury 50 stage 1 blades made of CMSX-10 alloy are in the process of being coated at CNY for first article evaluation.

WBS 19800 - Advanced Diffusers

No further testing was done on the test rig. The next tests will be on the half scale turbine rig and will be conducted in the second quarter of 1998.

WBS 19900 - Human-Machine Interface

The initial HMI system was completed and tested. A help system was developed. Testing of the interface with the RAMD system has been scheduled.

WBS 65000 - RAMD

The "first out" signals relatable to the critical components condition tracking were incorporated into the Mercury 50 system RAMD effects evaluation. Phase 1A controls development for the advanced MMI was completed, with integration into the RAMD software system under development with Fluor Daniel. Trial demonstration is expected in early April with the RAMD system implementation on schedule for demonstration on the first Mercury 50 field unit.

3.3 ATS-L Engine and Package

Cycle studies continued throughout the quarter in order to meet all technical and economic goals of the program. Two key initiatives were taken: (1) modifying the cycle to increase output power while retaining high thermal efficiency and (2) lowering product cost. The concept solution in the ATS-L size range will be selected to ensure competitiveness in both the mechanical drive and power generation markets.

Supportive compressor design work also proceeded, with a critical design review being held in late January on an ACE compressor design that is anticipated to be part of the product solution.

3.4 Test Rigs

WBS 42210 - Ultra Lean Premixed Combustor Test Rig

Test rig assembly was completed in January and installed into the atmospheric test facility for mapping prior to pressure testing in the recuperated full load condition. Atmospheric testing mapped liner metal temperatures, pattern factor, air diverter valve system and rig instrumentation up to 1000° F. Initial test results indicate:

- The system pressure loss at full load is close to the design value.
- The injector air flow modulation provided by the air diverter valve exceeded the design intent. Thus, there do not appear to be significant air leakage issues with the division plate seals.

- The stability performance, i.e lean blow out, is much better than expected and could provide a significant advantage in terms of extending the low emission range of operation of the engine.

- The emissions of NOx and CO appear to be very low, i.e less than 10 ppm 15% O2, although this will require further confirmation in later testing as there were instrumentation problems.

- The liner metal temperatures are broadly in-line with the design intent but certain areas on the liner are too hot for acceptable endurance.

- Exhaust gas temperature pattern factor is low, circa 0.1, although more testing is required to confirm this.

- The injectors appeared to be in good condition after the tests but were a little difficult to remove. Measurements suggest that this problem may be caused by dimensional changes to the liner dome during the braze operations and are avoidable.

- Pressure oscillations were encountered as the fuel flow was increased towards full load. Use of pilot fuel made matters worse, similar to experience on the single injector rig.

Full load testing is expected in late April.

WBS 42400 - Turbine Test Rig

The test article fabrication was completed mid January with some modifications required during assembly into the rig system. Baseline testing of the performance map, airfoil losses evaluation, swirl, temperature, and pressure profiles is projected to start by the end of April. Follow-on testing will evaluate EGV effects, diffuser/collector with and without vortex generators at different area ratios, and various stage 1 tip treatments effects.

WBS 42500 - Squeeze Film Damper Rig

The Solar squeeze film damper design completed fabrication mid January. Flow testing showed that oil supply flow at 100 psi and 130°F was somewhat higher than the previously tested Waukesha configuration, signifying lower lube oil pressure requirements. The difference in flow increased with increasing temperature. The displacement tests and dynamic stiffness/damping characterization tests are ongoing and are expected to be completed in April.

WBS 42600 - Instrumented Rotor Engine Test

Long lead time items of the rotor instrumentation/telemetry system were ordered. An interim design review was held reviewing the compressor and turbine hardware design modifications required to accommodate the installation and routing of the instrumentation, and the preliminary design of the telemetry components by Datatel and QAT. The instrumentation system and hardware is on schedule for Mercury 50 ESN1/Build 3 by February 1999.

4.0 PROGRAM MANAGEMENT

4.1 Program Management Activities

Three proposals were submitted to the California Energy Commission (CEC) in response to its First General Solicitation under the Public Interest Energy Research (PIER) program. These proposals are for work supplementing work under the current ATS program.

The first proposed project would supplement work in the ultra-lean premix (ULP) combustion area to achieve a stretch goal of 5 ppmv NOx. The second proposed project would be an add-on to the Saturn catalytic combustion demonstration that was approved earlier this year for funding under the Defense Conversion Matching Funds program. (The draft statement of work and budget were submitted this quarter for that project; however, no contract has yet been executed.) The third proposed project is a preliminary design study for a fuel reformation cycle using the Mercury 50 engine as the base engine for the study.

4.2 Program Status

The Financial Status Report (SF 269) and Federal Assistance management Summary Report (DOE Form F4600.5) for the month of December are attached.

As of the end of March there was an unfavorable 53.5% schedule variance against the 6 year baseline for the overall ATS program (55.0% last quarter). This is principally attributable to funding constraints resulting in the planned delay to the large engine program. A 0/100 percent complete assumption for program milestones in assessing progress on tasks also conservatively impacts the variance assessment.

An unfavorable cost variance of 2.7% (6.2% last quarter) is due in large part to the high degree of outsourcing and expediting to maintain project schedule on the Mercury 50 program.

The target date for build of the first Mercury 50 test engine has been slipped from June to August, with testing to start in September 1998. The principal items currently pacing the Mercury 50 schedule are:

- Stage 1 and 2 Turbine Blades
- Stage 1 Turbine Nozzle Segment
- Turbine Sliding Ring
- Stage 1 and 2 Tipshoes
- Turbine Nozzle Case
- Compressor Stators
- Center Frame Structure

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FEDERAL ASSISTANCE MANAGEMENT SUMMARY REPORT

OMB Burden Disclosure Statement

1910-0400

Replaces EIA-459E
All Other Editions Are Obsolete

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4. Name and Address

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P.O. Box 85376

San Diego, Ca. 92186-5376

5. Program/Project Start Date
9/14/95

6. Completion Date
9/14/00

7. FY98 8. Months

O	N	D	J	F	M	A	M	J	J	A	S

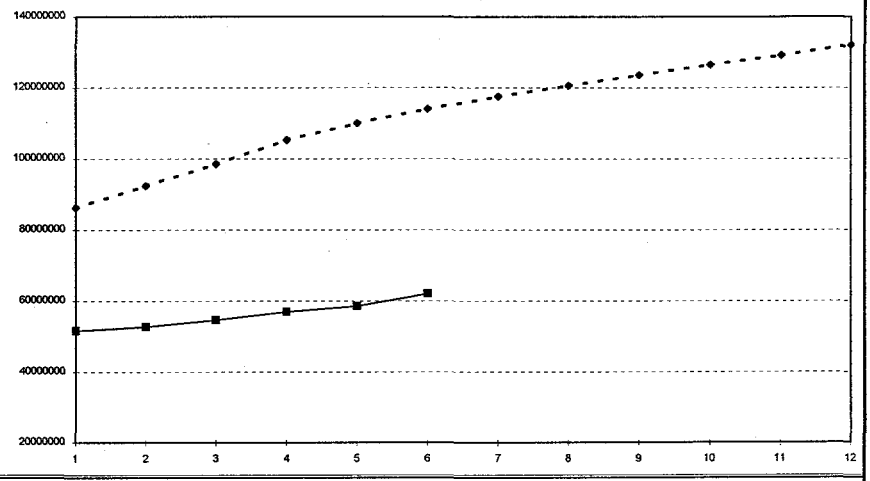
9. Cost Status:

a. Cost Status b. Dollar Scale

10. Cost Chart

Fund Source		Quarter - Fiscal Year 1998 1st	2nd	3rd	4th	Cum. to Date	Tot. Plan
DOE	P	8431192	6019909	3731571	3300643	21483314	67607576
	A	3273688	2919619	0	0	6193307	
Solar	P	9598837	9415754	5836559	5162543	30013694	97288952
	A	3475777	4566584	0	0	8042361	
Total Plan		18030029	15435663	9568130	8463186	51497008	164896528
Total Actual		6749465	7486203	0	0	14235668	
Variance		11280564	7949460	9568130	8463186	37261340	

P = Planned A = Actual



Total Planned Costs for Program / Project

Cumulative Accrued Costs

Planned ----	86249748	92405233	98610767	105191880	109916509	114046430	117560486	120593634	123614560	126620405	129303484	132077746
Actual ------	51584360	52669383	54608588	56972492	58568144	62094791						
Variance	34665388	39735850	44002179	48219388	51348365	51951639	117560486	120593634	123614560	126620405	129303484	132077746

11. Major Milestone Status	Units Planned / Units Complete	
	P / C	
	P / C	
	P / C	
	P / C	

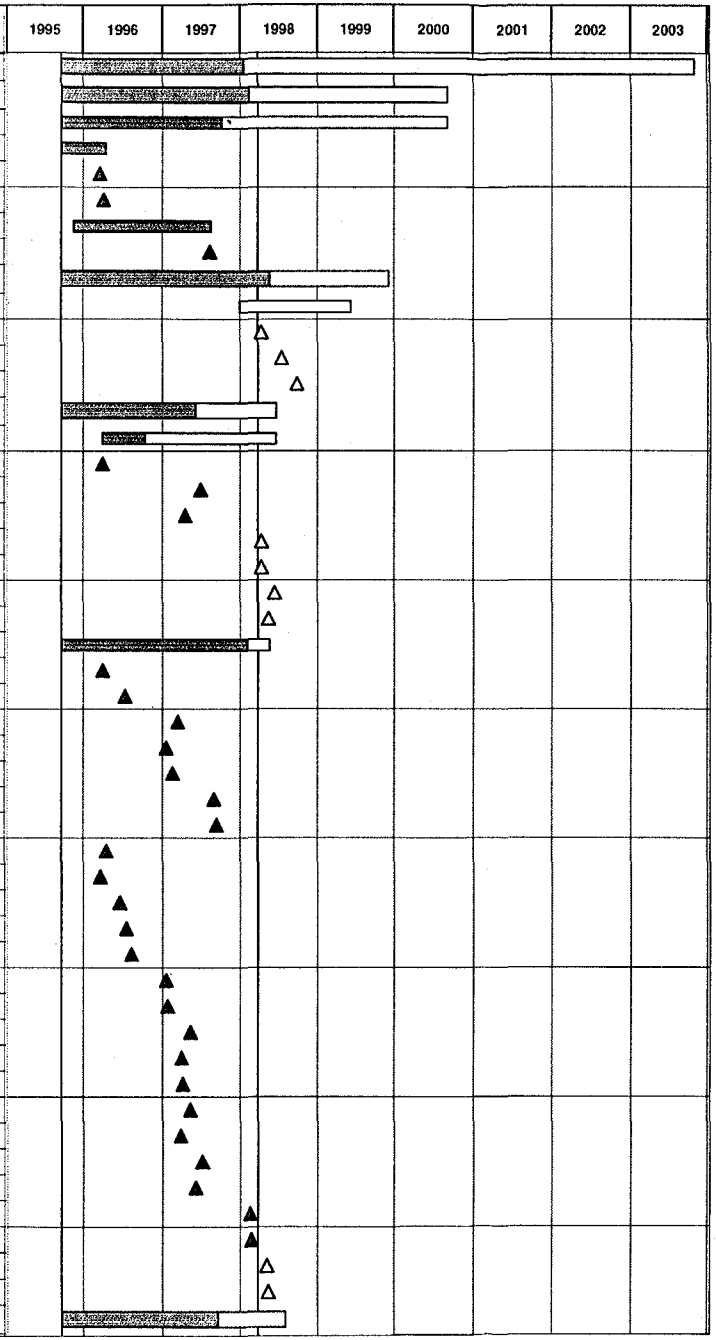
12. Remarks: Actuals through April 1998.

13. Signature of Recipient and Date

14. Signature of DOE Reviewing Representative and Date

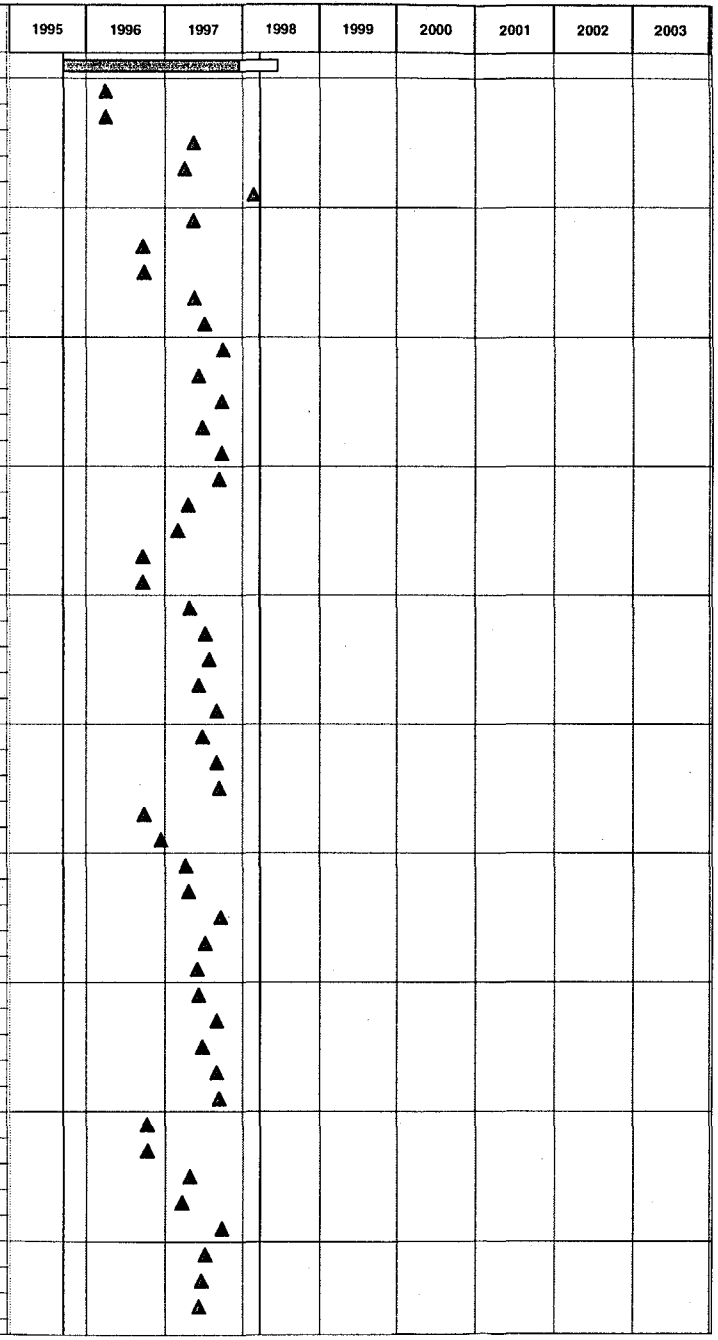
Advanced Turbine Systems
Phase 3 and 4
Filter: Total Program

WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
6074	**Advanced Turbine Systems (ATS)**		9/14/95	10/30/0	0	29%	
10000	**Advanced Turbine System - S**		9/14/95	8/31/00	0	49%	
10100	Technical Coordination - S		9/14/95	8/31/00	0	42%	
10200	Engine Definition - S		9/14/95	4/10/96	0	100%	
10200.1	Complete, Flowpath Definition - S		3/15/96	3/15/96	0.40	100%	
10200.2	Preliminary Design Review (PDR) - S		4/3/96	4/3/96	0.60	100%	
10300	Package Definition - S		11/14/95	8/15/97	0	100%	
10300.1	Complete Design Review, Package - S		8/15/97	8/15/97	1.00	100%	
11000	**Engine Assembly - S**		9/14/95	12/1/99	0	64%	
11010	Engine Build - S		1/5/98	6/4/99	0	1%	
11010.1	Complete Engine Assembly Drawings - S		4/15/98	4/15/98	0.10	0%	
11010.2	Complete Engine Build, In House Test Engine - S		7/15/98	7/15/98	0.90	0%	
11010.3	Complete Engine Build, H/D Patio Engine - S		9/30/98	9/30/98	0	0%	
11100	**Air Inlet System - S**	Various	9/14/95	6/15/98	0	63%	
11110	Air Inlet Duct Assy - S	245055-100	4/1/96	6/15/98	0	25%	
11110.1	Start DLA, Air Inlet Duct Assy - S	245055-100	4/1/96	4/1/96	0.05	100%	
11110.2	Appd CPD / Dwg, Air Inlet Duct Sub-Assy - S	245056	7/3/97	7/3/97	0.20	100%	Late - Need 4-25-97 (Past Due)
11110.3	Need Dwg, Air Inlet Duct Sub-Assy - S	245056	4/25/97	4/25/97	0	100%	Past Due
11110.4	Appd CPD / Dwg, Air Inlet Duct Assy - S	245055	4/15/98	4/15/98	0.25	0%	Critical - Need 4-15-98
11110.5	Need Dwg, Air Inlet Duct Assy - S	245055	4/15/98	4/15/98	0	0%	
11110.6	Complete Assy, Air Inlet Duct Assy - S	245055-100	6/15/98	6/15/98	0.50	0%	Late - Need 5-15-98
11110.7	Need Assy, Air Inlet Duct Assy - S	245055-100	5/15/98	5/15/98	0	0%	
11120	**Air Inlet / Bearing Case Assy - S**	245060-100	9/14/95	5/15/98	0	90%	
11120.1	Start DLA, Air Inlet / Bng Case Assy - S	245060-100	4/1/96	4/1/96	0.03	100%	
11120.2	Start CFD, Air Inlet / Bng Case Assy - S	245060-100	7/10/96	7/10/96	0.02	100%	
11120.3	Complete CFD, Air Inlet / Bng Case Assy - S	245060-100	3/17/97	3/17/97	0.05	100%	
11120.4	Appd Casting CPD / Dwg, Inlet Air Assy - S	245062	1/22/97	1/22/97	0.10	100%	
11120.5	Need Casting CPD, Inlet Air Assy - S	245062	2/21/97	2/21/97	0	100%	
11120.6	Appd Machining CPD / Dwg, Air Inlet Assy - S	245061	9/2/97	9/2/97	0.10	100%	
11120.7	Need Machining Dwg, Air Inlet Assy - S	245061	9/15/97	9/15/97	0	100%	
11120.8	Complete Thrust Load Anal, Turbine Rotor Assy - S		4/16/96	4/16/96	0.02	100%	
11120.9	Confirm Damper Requirement, Turbine Rotor Assy - S		3/14/96	3/14/96	0.02	100%	
11120.10	Complete, Shaft / Support Dimensions - S		6/17/96	6/17/96	0.02	100%	
11120.11	Send Out RFQ, Rotor Bearings - S		7/17/96	7/17/96	0.02	100%	
11120.12	Send Out RFQ, Squeeze Film Damper - S		8/8/96	8/8/96	0.02	100%	
11120.13	Review RFQ, Bearings/Dampers - S		1/24/97	1/24/97	0.05	100%	
11120.14	Complete, Bearings/Damper Integration - S		1/30/97	1/30/97	0.05	100%	
11120.15	Start, Backup Bearing Plan (If Needed) - S		5/20/97	5/20/97	0	100%	
11120.16	Appd CPD / Dwg, Roller Bearing Assy - S	245067	4/5/97	4/5/97	0.05	100%	
11120.17	Place PO, Roller Bearing Assy - S	245067-1	4/9/97	4/9/97	0.05	100%	
11120.18	Appd Casting CPD / Dwg, #1 Bearing Case - S	245065	5/19/97	5/19/97	0.10	100%	Late - Need 3-31-97 (Past Due)
11120.19	Need Casting Dwg, #1 Bearing Case - S	245065	3/31/97	3/31/97	0	100%	Past Due
11120.20	Appd Machining CPD / Dwg, #1 Bearing Case - S	245064	7/8/97	7/8/97	0.10	100%	Late - Need 6-11-97 (Past Due)
11120.21	Need Machining Dwg, #1 Bearing Case - S	245064	6/11/97	6/11/97	0	100%	
11120.22	Appd Assy CPD / Dwg, Air Inlet / Bng Case Assy - S	245060	2/23/98	2/23/98	0.10	100%	
11120.23	Need Assy Dwg, Air Inlet / Bng Case Assy - S	245060	2/28/98	2/28/98	0	100%	
11120.24	Complete Assy, Air Inlet / Bng Case Assy - S	245060-100	5/14/98	5/14/98	0.10	0%	
11120.25	Need Assy, Air Inlet / Bng Case Assy - S	245060-100	5/15/98	5/15/98	0	0%	
11200	**Compressor Section - S**	Various	9/14/95	7/30/98	0	71%	



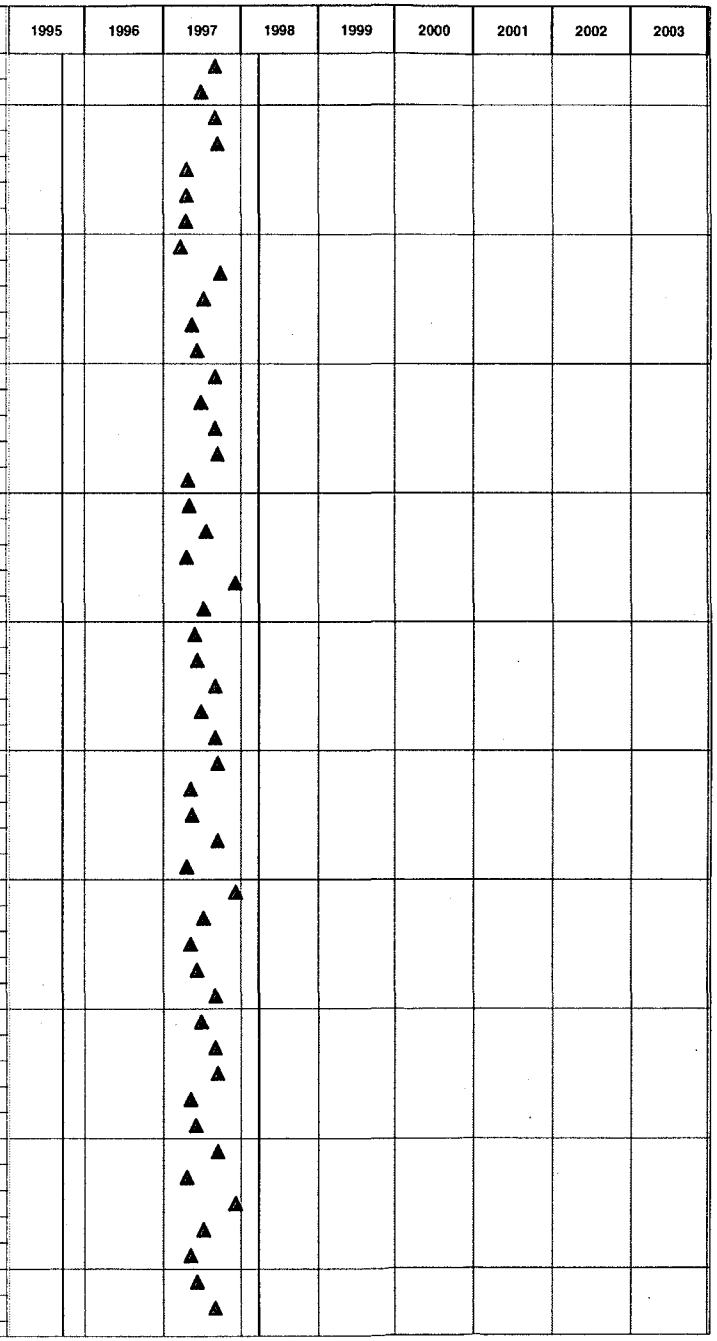
Advanced Turbine Systems
Phase 3 and 4
Filter: Total Program

WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11210	Compressor Rotor Assembly - S	245070-100	9/14/95	6/15/98	0	83%	
11210.1	Start DLA, Compr Rotor Assy - S	245070-100	4/1/96	4/1/96	0.03	100%	
11210.2	Start CFD, Compr Rotor Assy - S	245070-100	4/1/96	4/1/96	0.04	100%	
11210.3	Appd Forging CPD / Dwg, Fwd Compr Cone - S	245076	5/19/97	5/19/97	0.01	100%	Late - Need 4-5-97 (Past Due)
11210.4	Need Forging Dwg, Fwd Compr Cone - S	245076	4/5/97	4/5/97	0	100%	Past Due
11210.5	Appd CPD / Dwg, Fwd Compr Cone - S	245075	2/26/98	2/26/98	0.01	100%	Late - Need 5-18-97 (Past Due)
11210.6	Need Dwg, Fwd Compr Cone - S	245075	5/18/97	5/18/97	0	100%	
11210.7	Complete Aero Design, Compr Blade Stg 1 - S	245090-1	9/20/96	9/20/96	0.01	100%	
11210.8	Complete Mech Design, Compr Blade Stg 1 - S	245090-1	9/27/96	9/27/96	0.02	100%	
11210.9	Appd CPD / Dwg, Compr Blade Stg 1- S	245090	5/21/97	5/21/97	0.02	100%	
11210.10	Need Dwg, Compr Blade Stg 1 - S	245090	7/8/97	7/8/97	0	100%	
11210.11	Appd Forging CPD / Dwg, Compr Disk Stg 1 - S	245089	10/3/97	10/3/97	0.01	100%	Late - Need 6-10-97 (Past Due)
11210.12	Need Forging Dwg, Compr Disk Stg 1 - S	245089	6/10/97	6/10/97	0	100%	
11210.13	Appd Machine CPD / Dwg, Compr Disk Stg 1 - S	245110	9/26/97	9/26/97	0.01	100%	
11210.14	Need Machine Dwg, Compr Disk Stg 1 - S	245110	6/26/97	6/26/97	0	100%	
11210.15	Appd CPD / Release Dwg, Compr Disk Assy Stg 1 - S	245110	9/26/97	9/26/97	0	100%	
11210.16	Need Dwg, Compr Disk Assy Stg 1 - S	245110	9/15/97	9/15/97	0	100%	
11210.17	Appd CPD, New Curvic Tooth Dwg	105242	4/21/97	4/21/97	0.02	100%	
11210.18	Need Dwg, New Curvic Tooth Dwg	105242	3/3/97	3/3/97	0	100%	
11210.19	Complete Aero Design, Compr Blade Stg 2 - S	245100-1	9/20/96	9/20/96	0.01	100%	
11210.20	Complete Mech Design, Compr Blade Stg 2- S	245100-1	9/24/96	9/24/96	0.01	100%	
11210.21	Appd CPD / Dwg, Compr Blade Stg 2 - S	245100	5/1/97	5/1/97	0.02	100%	
11210.22	Need Dwg, Compr Blade Stg 2 - S	245100	7/8/97	7/8/97	0	100%	
11210.23	Appd Forging CPD / Dwg, Compr Disk Stg 2 - S	245097	7/30/97	7/30/97	0.01	100%	Late - Need 6-10-97 (Past Due)
11210.24	Need Forging Dwg, Compr Disk Stg 2 - S	245097	6/10/97	6/10/97	0	100%	
11210.25	Appd Machine CPD / Dwg, Compr Disk Stg 2 - S	245120	9/5/97	9/5/97	0.01	100%	Late - Need 6-26-97 (Past Due)
11210.26	Need Machine Dwg, Compr Disk Stg 2 - S	245120	6/26/97	6/26/97	0	100%	
11210.27	Appd CPD / Dwg, Compr Disk Assy Stg 2 - S	245120	9/5/97	9/5/97	0.01	100%	
11210.28	Need Dwg, Compr Disk Assy Stg 2 - S	245120	9/15/97	9/15/97	0	100%	
11210.29	Complete Aero Design, Compr Blade Stg 3 - S	245115-1	9/26/96	9/26/96	0.01	100%	
11210.30	Complete Mech Design, Compr Blade Stg 3 - S	245115-1	12/16/96	12/16/96	0.01	100%	
11210.30a	Appd Casting CPD / Dwg, Compr Blade Stg 3 - S	245116	4/11/97	4/11/97	0.01	100%	
11210.30b	Need Casting Dwg, Compr Blade Stg 3 - S	245116	4/23/97	4/23/97	0	100%	
11210.31	Appd CPD / Dwg, Compr Blade Stg 3 - S	245115	9/24/97	9/24/97	0.01	100%	Late - Need 7-8-97 (Past Due)
11210.32	Need Dwg, Compr Blade Stg 3 - S	245115	7/8/97	7/8/97	0	100%	
11210.33	Appd Casting CPD / Dwg, Compr Disk Stg 3 - S	245112	6/2/97	6/2/97	0.01	100%	Critical - Need 6-10-97
11210.34	Need Casting Dwg, Compr Disk Stg 3 - S	245112	6/10/97	6/10/97	0	100%	
11210.35	Appd Machine CPD / Dwg, Compr Disk Stg 3 - S	245130	9/5/97	9/5/97	0.01	100%	Late - Need 6-26-97 (Past Due)
11210.36	Need Machine Dwg, Compr Disk Stg 3 - S	245130	6/26/97	6/26/97	0	100%	
11210.37	Release Dwg, Compr Disk Assy Stg 3 - S	245130	9/5/97	9/5/97	0.01	100%	
11210.38	Need Dwg, Compr Disk Assy Stg 3 - S	245130	9/15/97	9/15/97	0	100%	
11210.39	Complete Aero Design, Compr Blade Stg 4 - S	245131-1	10/7/96	10/7/96	0.01	100%	
11210.40	Complete Mech Design, Compr Blade Stg 4 - S	245131-1	10/10/96	10/10/96	0.01	100%	
11210.40a	Appd Casting CPD / Dwg, Compr Blade Stg 4 - S	245132	4/29/97	4/29/97	0.01	100%	
11210.40b	Need Casting Dwg, Compr Blade Stg 4 - S	245132	3/24/97	3/24/97	0	100%	
11210.41	Appd CPD / Dwg, Compr Blade Stg 4 - S	245131	9/25/97	9/25/97	0.01	100%	Late - Need 7-8-97 (Past Due)
11210.42	Need Dwg, Compr Blade Stg 4 - S	245131	7/8/97	7/8/97	0	100%	
11210.43	Appd Forging CPD / Dwg, Compr Disk Stg 4 - S	245127	6/23/97	6/23/97	0.01	100%	Critical - Need 6-10-97
11210.44	Need Forging Dwg, Compr Disk Stg 4 - S	245127	6/10/97	6/10/97	0	100%	



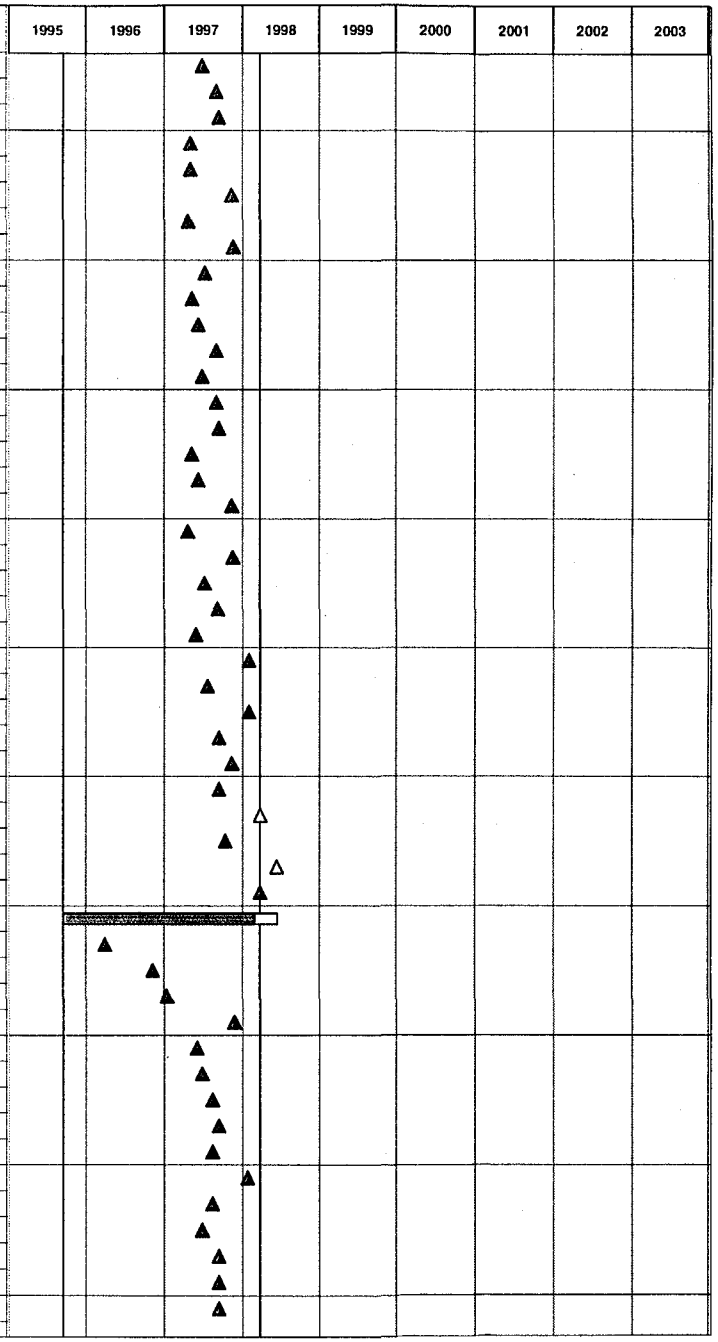
Advanced Turbine Systems
Phase 3 and 4
Filter: Total Program

WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11210.45	Appd Machine CPD / Dwg, Compr Disk Stg 4 - S	245140	9/5/97	9/5/97	0.01	100%	Late Need 6-26-97 (Past Due)
11210.46	Need Machine Dwg, Compr Disk Stg 4 - S	245140	6/26/97	6/26/97	0	100%	
11210.47	Release Dwg, Compr Disk Assy Stg 4 - S	245140	9/5/97	9/5/97	0.01	100%	
11210.48	Need Dwg, Compr Disk Assy Stg 4 - S	245140	9/15/97	9/15/97	0	100%	
11210.49	Complete Aero Design, Compr Blade Stg 5 - S	245145-1	4/25/97	4/25/97	0.01	100%	
11210.50	Complete Mech Design, Compr Blade Stg 5 - S	245145-1	4/25/97	4/25/97	0.01	100%	
11210.50a	Appd Casting CPD / Dwg, Compr Blade Stg 5 - S	245146	4/15/97	4/15/97	0.01	100%	
11210.50b	Need Casting Dwg, Compr Blade Stg 5 - S	245146	3/24/97	3/24/97	0	100%	
11210.51	Appd CPD / Dwg, Compr Blade Stg 5 - S	245145	9/26/97	9/26/97	0.01	100%	Late - Need 7-8-97 (Past Due)
11210.52	Need Dwg, Compr Blade Stg 5 - S	245145	7/8/97	7/8/97	0	100%	
11210.53	Appd Forging CPD / Dwg, Compr Disk Stg 5 - S	245142	5/15/97	5/15/97	0.01	100%	
11210.54	Need Forging Dwg, Compr Disk Stg 5 - S	245142	6/10/97	6/10/97	0	100%	
11210.55	Appd Machine CPD / Dwg, Compr Disk Stg 5 - S	245150	9/5/97	9/5/97	0.01	100%	Late - Need 6-26-97 (Past Due)
11210.56	Need Machine Dwg, Compr Disk Stg 5 - S	245150	6/26/97	6/26/97	0	100%	
11210.57	Appd CPD / Dwg, Compr Disk Assy Stg 5 - S	245150	9/5/97	9/5/97	0.01	100%	
11210.58	Need Dwg, Compr Disk Assy Stg 5 - S	245150	9/15/97	9/15/97	0	100%	
11210.59	Complete Aero Design, Compr Blade Stg 6 - S	245161-1	5/1/97	5/1/97	0.01	100%	
11210.60	Complete Mech Design, Compr Blade Stg 6 - S	245161-1	5/6/97	5/6/97	0.01	100%	
11210.60a	Appd Casting CPD / Dwg, Compr Blade Stg 6 - S	245162	7/22/97	7/22/97	0.01	100%	Late - Need 4-23-97 (Past Due)
11210.60b	Need Casting Dwg, Compr Blade Stg 6 - S	245162	4/23/97	4/23/97	0	100%	Past Due
11210.61	Appd CPD / Dwg, Compr Blade Stg 6 - S	245161	12/8/97	12/8/97	0.01	100%	Late - Need 7-8-97 (Past Due)
11210.62	Need Dwg, Compr Blade Stg 6 - S	245161	7/8/97	7/8/97	0	100%	
11210.63	Appd Forging CPD / Dwg, Compr Disk Stg 6 - S	245157	5/27/97	5/27/97	0.01	100%	
11210.64	Need Forging Dwg, Compr Disk Stg 6 - S	245157	6/10/97	6/10/97	0	100%	
11210.65	Appd Machine CPD / Dwg, Compr Disk Stg 6 - S	245160	9/5/97	9/5/97	0.01	100%	Late - Need 6-26-97 (Past Due)
11210.66	Need Machine Dwg, Compr Disk Stg 6 - S	245160	6/26/97	6/26/97	0	100%	
11210.67	Appd CPD / Release Dwg, Compr Disk Assy Stg 6 - S	245160	9/5/97	9/5/97	0.01	100%	
11210.68	Need Dwg, Compr Disk Assy Stg 6 - S	245160	9/15/97	9/15/97	0	100%	
11210.69	Complete Aero Design, Compr Blade Stg 7 - S	245175-1	5/9/97	5/9/97	0.01	100%	
11210.70	Complete Mech Design, Compr Blade Stg 7 - S	245175-1	5/16/97	5/16/97	0.01	100%	
11210.70a	Appd Casting CPD / Dwg, Compr Blade Stg 7 - S	245176	9/13/97	9/13/97	0.01	100%	Late - Need 4-23-97 (Past Due)
11210.70b	Need Casting Dwg, Compr Blade Stg 7 - S	245176	4/23/97	4/23/97	0	100%	Past Due
11210.71	Appd CPD / Dwg, Compr Blade Stg 7 - S	245175	12/8/97	12/8/97	0.01	100%	Late - Need 7-8-97 (Past Due)
11210.72	Need Dwg, Compr Blade Stg 7 - S	245175	7/8/97	7/8/97	0	100%	
11210.73	Appd Forging CPD / Dwg, Compr Disk Stg 7 - S	245172	5/8/97	5/8/97	0.01	100%	
11210.74	Need Forging Dwg, Compr Disk Stg 7 - S	245172	6/10/97	6/10/97	0	100%	
11210.75	Appd Machine CPD / Dwg, Compr Disk Stg 7 - S	245170	9/5/97	9/5/97	0.01	100%	Late - Need 6-26-97 (Past Due)
11210.76	Need Machine Dwg, Compr Disk Stg 7 - S	245170	6/26/97	6/26/97	0	100%	
11210.77	Appd CPD / Dwg, Compr Disk Assy Stg 7 - S	245170	9/5/97	9/5/97	0.01	100%	Late - Need 9-15-97
11210.78	Need Dwg, Compr Disk Assy Stg 7 - S	245170	9/15/97	9/15/97	0	100%	
11210.79	Complete Aero Design, Compr Blade Stg 8 - S	245191-1	5/13/97	5/13/97	0.01	100%	
11210.80	Complete Mech Design, Compr Blade Stg 8 - S	245191-1	6/6/97	6/6/97	0.01	100%	
11210.80a	Appd Casting CPD / Dwg, Compr Blade Stg 8 - S	245192	9/18/97	9/18/97	0.01	100%	Late - Need 4-30-97 (Past Due)
11210.80b	Need Casting Dwg, Compr Blade Stg 8 - S	245192	4/23/97	4/23/97	0	100%	Past Due
11210.81	Appd CPD / Dwg, Compr Blade Stg 8 - S	245191	12/8/97	12/8/97	0.01	100%	Late - Need 4-30-97 (Past Due)
11210.82	Need Dwg, Compr Blade Stg 8 - S	245191	7/8/97	7/8/97	0	100%	Past Due
11210.83	Appd Forging CPD / Dwg, Compr Disk Stg 8 - S	245187	5/8/97	5/8/97	0.01	100%	
11210.84	Need Forging Dwg, Compr Disk Stg 8 - S	245187	6/10/97	6/10/97	0	100%	
11210.85	Appd Machine CPD / Dwg, Compr Disk Stg 8 - S	245180	9/5/97	9/5/97	0.01	100%	Late - Need 6-26-97 (Past Due)



Advanced Turbine Systems
Phase 3 and 4
Filter: Total Program

WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11210.86	Need Machine Dwg, Compr Disk Stg 8 - S	245180	6/26/97	6/26/97	0	100%	
11210.87	Appd CPD / Release Dwg, Compr Disk Assy Stg 8 - S	245180	9/5/97	9/5/97	0.01	100%	
11210.88	Need Dwg, Compr Disk Assy Stg 8 - S	245180	9/15/97	9/15/97	0	100%	
11210.89	Complete Aero Design, Compr Blade Stg 9 - S	245205-1	5/6/97	5/6/97	0.01	100%	
11210.90	Complete Mech Design, Compr Blade Stg 9 - S	245205-1	5/7/97	5/7/97	0.01	100%	
11210.90a	Appd Casting CPD / Dwg, Compr Blade Stg 9 - S	245206	11/14/97	11/14/97	0.01	100% Late - Need 4-23-97 (Past Due)	
11210.90b	Need Casting Dwg, Compr Blade Stg 9 - S	245206	4/23/97	4/23/97	0	100% Past Due	
11210.91	Appd CPD / Dwg, Compr Blade Stg 9 - S	245205	11/21/97	11/21/97	0.01	100% Late - Need 7-8-97 (Past Due)	
11210.92	Need Dwg, Compr Blade Stg 9 - S	245205	7/8/97	7/8/97	0	100%	
11210.93	Appd Forging CPD / Dwg, Compr 9 Disk Stg 9 - S	245202	5/8/97	5/8/97	0.01	100%	
11210.94	Need Forging Dwg, Compr Disk Stg 9 - S	245202	6/10/97	6/10/97	0	100%	
11210.95	Appd Machine CPD / Dwg, Compr Disk Stg 9 - S	245190	9/5/97	9/5/97	0.01	100% Late - Need 6-26-97 (Past Due)	
11210.96	Need Machine Dwg, Compr Disk Stg 9 - S	245190	6/26/97	6/26/97	0	100%	
11210.97	Appd CPD / Dwg, Compr Disk Assy Stg 9 - S	245190	9/5/97	9/5/97	0.01	100%	
11210.98	Need Dwg, Compr Disk Assy Stg 9 - S	245190	9/15/97	9/15/97	0	100%	
11210.99	Complete Aero Design, Compr Blade Stg 10 - S	245220-1	5/8/97	5/8/97	0.01	100%	
11210.100	Complete Mech Design, Compr Blade Stg 10 - S	245220-1	6/11/97	6/11/97	0.01	100%	
11210.100a	Appd Casting CPD / Dwg, Compr Blade Stg 10 - S	245221	11/14/97	11/14/97	0.01	100% Late - Need 4-23-97 (Past Due)	
11210.100b	Need Casting Dwg, Compr Blade Stg 10 - S	245221	4/23/97	4/23/97	0	100% Past Due	
11210.101	Appd CPD / Dwg, Compr Blade Stg 10 - S	245220	11/21/97	11/21/97	0.01	100% Late - Need 7-8-97 (Past Due)	
11210.102	Need Dwg, Compr Blade Stg 10 - S	245220	7/8/97	7/8/97	0	100%	
11210.103	Appd Forging CPD / Dwg, Compr Aft Hub Stg 10 - S	245217	9/10/97	9/10/97	0.01	100% Late - Need 5-27-97 (Past Due)	
11210.104	Need Forging Dwg, Compr Aft Hub Stg 10 - S	245217	5/27/97	5/27/97	0	100% Past Due	
11210.105	Appd Machine CPD / Dwg, Compr Aft Hub Stg 10 - S	245200	2/3/98	2/3/98	0.01	100% Late - Need 7-26-97 (Past Due)	
11210.106	Need Machine Dwg, Compr Aft Hub Stg 10 - S	245200	7/26/97	7/26/97	0	100%	
11210.107	Appd CPD / Dwg, Compr Aft Hub Assy Stg 10 - S	245200	2/3/98	2/3/98	0.01	100% Late - Need 9-15-97 (Past Due)	
11210.108	Need Dwg, Compr Aft Hub Assy Stg 10 - S	245200	9/15/97	9/15/97	0	100%	
11210.109	Appd CPD / Dwg, Compr Center Bolt - S	245079	11/14/97	11/14/97	0.01	100% Late - Need 9-16-97 (Past Due)	
11210.110	Need Dwg, Compr Center Bolt - S	245079	9/16/97	9/16/97	0	100%	
11210.111	Appd CPD / Dwg, Compressor Rotor Assy - S	245070	4/1/98	4/1/98	0.01	0% Late - Need 10-16-97	
11210.112	Need Dwg, Compressor Rotor Assy - S	245070	10/16/97	10/16/97	0	100%	
11210.113	Complete Assy, Compressor Rotor Assy - S	245070-100	6/15/98	6/15/98	0.16	0% Late - Need 3-31-98	
11210.114	Need, Compressor Rotor Assy - S	245070-100	3/31/98	3/31/98	0	100%	
11220	**Compressor Casing / Stator Assy - S**	**245230-100**	9/14/95	6/15/98	0	90%	
11220.1	Start DLA, Compressor Housing Assy - S	245231-100	4/1/96	4/1/96	0.05	100%	
11220.2	Appd Casting CPD / Dwg, Compressor Casing Half -	245232	11/7/96	11/7/96	0.15	100%	
11220.3	Need Casting Dwg, Compressor Casing Half - S	245232	1/17/97	1/17/97	0	100%	
11220.4	Appd Mach CPD / Dwg, Compressor Housing - S	245231	11/26/97	11/26/97	0.15	100% Late - Need 6-2-97 (Past Due)	
11220.5	Need Assy Dwg, Compressor Housing Assy - S	245231	6/2/97	6/2/97	0	100%	
11220.6	Complete DLA, VGV Actuation System - S	245234	7/1/97	7/1/97	0.05	100%	
11220.7	Appd CPD / Dwg, IGV Split Ring Actuating Assy - S	245234	8/18/97	8/18/97	0.10	100%	
11220.8	Need Dwg, VGV Split Ring Actuating Assy - S	245234	9/15/97	9/15/97	0	100%	
11220.9	Complete Assy, IGV Split Ring Actuating Assy - S	245234-100	8/18/97	8/18/97	0.10	100%	
11220.10	Need Assy, IGV Split Ring Actuating Assy - S	245234-100	1/29/98	1/29/98	0	100%	
11220.11	Appd CPD / Dwg, Stg 1 VGV Split Ring - S	245241	8/18/97	8/18/97	0.05	100% Late - Need 7-1-97 (Past Due)	
11220.12	Need Dwg, Stg 1 VGV Split Ring - S	245241	7/1/97	7/1/97	0	100%	
11220.13	Appd CPD / Dwg, Stg 1 VGV Split Ring Actuating Ass	245235	9/13/97	9/13/97	0.05	100% Critical - Need 9-15-97	
11220.14	Need Dwg, Stg 1 VGV Split Ring Actuating Assy - S	245235	9/15/97	9/15/97	0	100%	
11220.15	Complete Assy, Stg 1 VGV Split Ring Actuating Assy -	245235-100	9/13/97	9/13/97	0.10	100%	



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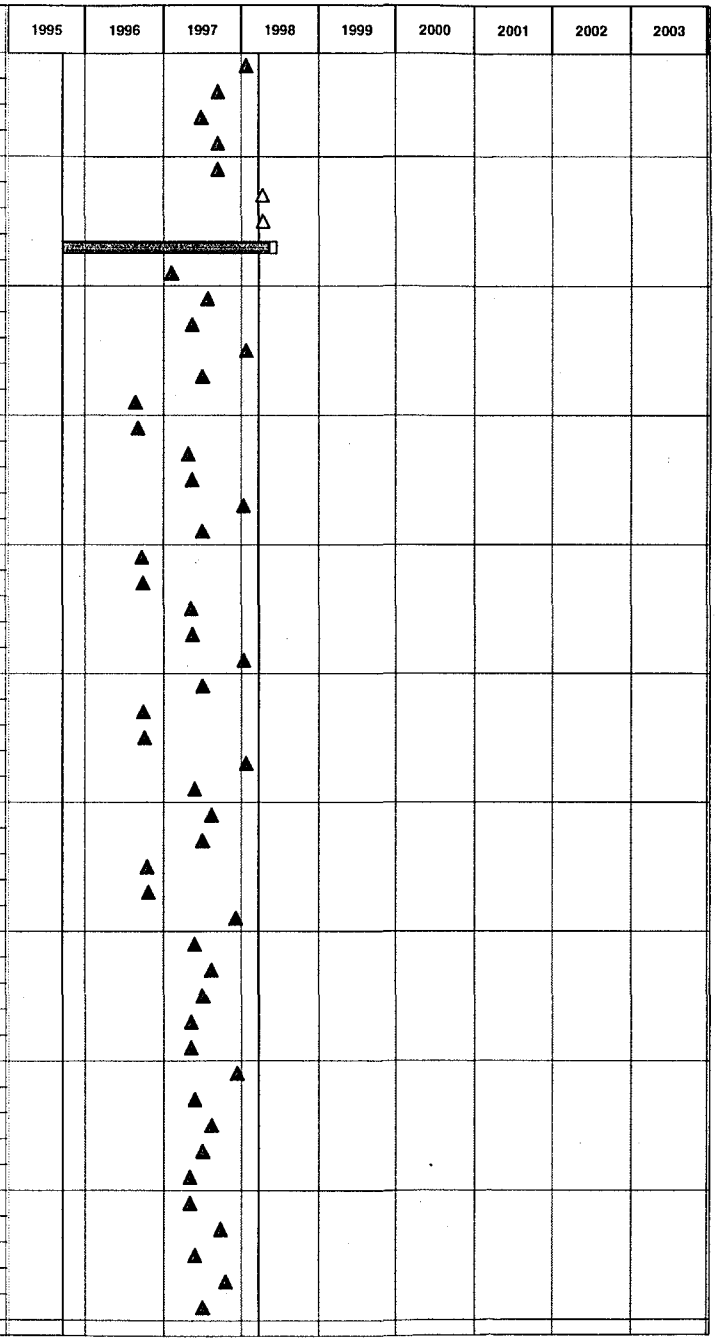
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11220.16	Need Assy, Stg 1 VGV Split Ring Actuating Assy - S	245235-100	1/29/98	1/29/98	0	100%	
11220.17	Appd CPD / Dwg, Stg 2 VGV Split Ring - S	245242	9/15/97	9/15/97	0.05	100%	Late - Need 7-1-97 (Past Due)
11220.18	Need Dwg, Stg 2 VGV Split Ring - S	245242	7/1/97	7/1/97	0	100%	
11220.19	Appd CPD / Dwg, Stg 2 VGV Split Ring Actuating Ass	245236	9/13/97	9/13/97	0.05	100%	Critical - Need 9-15-97
11220.20	Need Dwg, Stg 2 VGV Split Ring Actuating Assy - S	245236	9/15/97	9/15/97	0	100%	
11220.21	Complete Assy, Stg 2 VGV Split Ring Actuating Assy -	245236-100	4/15/98	4/15/98	0.10	0%	
11220.22	Need Assy, Stg 2 VGV Split Ring Actuating Assy - S	245236-100	4/16/98	4/16/98	0	0%	
11230	**Compressor Stator Assy - S**	**Various**	**9/14/95**	**6/15/98**	**0**	**97%**	
11220.23	Complete Mech Design, IGV - S	245250-1	2/11/97	2/11/97	0.02	100%	
11220.24	Appd Casting CPD / Dwg, IGV - S	245251	8/1/97	8/1/97	0.02	100%	Late - Need 5-17-97 (Past Due)
11220.25	Need Casting Dwg, IGV - S	245251	5/17/97	5/17/97	0	100%	Past Due
11220.26	Appd Airfoil CPD / Dwg, IGV - S	245250	1/27/98	1/27/98	0.02	100%	Late - Need 7-2-97 (Past Due)
11220.27	Need Airfoil Dwg, IGV - S	245250	7/2/97	7/2/97	0	100%	
11220.28	Complete Aero Design, Stage 1 Compsr Vane - S	245260-1	8/23/96	8/23/96	0.02	100%	
11220.29	Complete Mech Design, Stage 1 Compsr Vane - S	245260-1	9/6/96	9/6/96	0.02	100%	
11220.30	Appd Casting CPD / Dwg, Stage 1 Compsr Vane - S	245261	5/1/97	5/1/97	0.02	100%	
11220.31	Need Casting Dwg, Stage 1 Compsr Vane - S	245261	5/17/97	5/17/97	0	100%	
11220.32	Appd Airfoil CPD / Dwg, Stage 1 Compsr Vane - S	245260	1/15/98	1/15/98	0.02	100%	Late - Need 7-2-97 (Past Due)
11220.33	Need Airfoil Dwg, Stage 1 Compsr Vane - S	245260	7/2/97	7/2/97	0	100%	
11220.34	Complete Aero Design, Stage 2 Compsr Vane - S	245270-1	9/20/96	9/20/96	0.02	100%	
11220.35	Complete Mech Design, Stage 2 Compsr Vane - S	245270-1	9/25/96	9/25/96	0.02	100%	
11220.36	Appd Casting CPD / Dwg, Stage 2 Compsr Vane - S	245271	5/8/97	5/8/97	0.02	100%	
11220.37	Need Casting Dwg, Stage 2 Compsr Vane - S	245271	5/17/97	5/17/97	0	100%	
11220.38	Appd Airfoil CPD / Dwg, Stage 2 Compsr Vane - S	245270	1/15/98	1/15/98	0.02	100%	Late - Need 7-2-97 (Past Due)
11220.39	Need Airfoil Dwg, Stage 2 Compsr Vane - S	245270	7/2/97	7/2/97	0	100%	
11220.40	Complete Aero Design, Stage 3 Compsr Stator - S	245280-100	9/25/96	9/25/96	0.02	100%	
11220.41	Complete Mech Design, Stage 3 Compsr Stator - S	245280-100	10/1/96	10/1/96	0.02	100%	
11220.42	Appd CPD / Dwg, Stage 3 Compsr Stator Vane - S	245281	1/30/98	1/30/98	0.03	100%	Late - On Hold
11220.43	Need Dwg, Stage 3 Compsr Stator Vane - S	245281	6/1/97	6/1/97	0	100%	
11220.44	Appd CPD / Dwg, Stage 3 Compsr Stator Assy - S	245280	8/14/97	8/14/97	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.45	Need Dwg, Stage 3 Compsr Stator Assy - S	245280	7/2/97	7/2/97	0	100%	
11220.46	Complete Aero Design, Stage 4 Compsr Stator - S	245285-100	10/15/96	10/15/96	0.02	100%	
11220.47	Complete Mech Design, Stage 4 Compsr Stator - S	245285-100	10/22/96	10/22/96	0.02	100%	
11220.48	Appd CPD / Dwg, Stage 4 Compsr Stator Vane - S	245286	12/12/97	12/12/97	0.03	100%	Late - On Hold
11220.49	Need Dwg, Stage 4 Compsr Stator Vane - S	245286	6/1/97	6/1/97	0	100%	
11220.50	Appd CPD / Dwg, Stage 4 Compsr Stator Assy - S	245285	8/14/97	8/14/97	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.51	Need Dwg, Stage 4 Compsr Stator Assy - S	245285	7/2/97	7/2/97	0	100%	
11220.52	Complete Aero Design, Stage 5 Compsr Stator - S	245290-100	5/9/97	5/9/97	0.02	100%	
11220.53	Complete Mech Design, Stage 5 Compsr Stator - S	245290-100	5/9/97	5/9/97	0.02	100%	
11220.54	Appd CPD / Dwg, Stage 5 Compsr Stator Vane - S	245291	12/15/97	12/15/97	0.03	100%	Late - On Hold
11220.55	Need Dwg, Stage 5 Compsr Stator Vane - S	245291	6/1/97	6/1/97	0	100%	
11220.56	Appd CPD / Dwg, Stage 5 Compsr Stator Assy - S	245290	8/14/97	8/14/97	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.57	Need Dwg, Stage 5 Compsr Stator Assy - S	245290	7/2/97	7/2/97	0	100%	
11220.58	Complete Aero Design, Stage 6 Compsr Stator - S	245295-100	5/5/97	5/5/97	0.02	100%	
11220.59	Complete Mech Design, Stage 6 Compsr Stator - S	245295-100	5/5/97	5/5/97	0.02	100%	
11220.60	Appd CPD / Dwg, Stage 6 Comp Stator Vane - S	245296	10/1/97	10/1/97	0.03	100%	Late - Need 6-1-97 (Past Due)
11220.61	Need Dwg, Stage 6 Comp Stator Vane - S	245296	6/1/97	6/1/97	0	100%	
11220.62	Appd CPD / Dwg, Stage 6 Comp Stator Assy - S	245295	10/20/97	10/20/97	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.63	Need Dwg, Stage 6 Comp Stator Assy - S	245295	7/2/97	7/2/97	0	100%	



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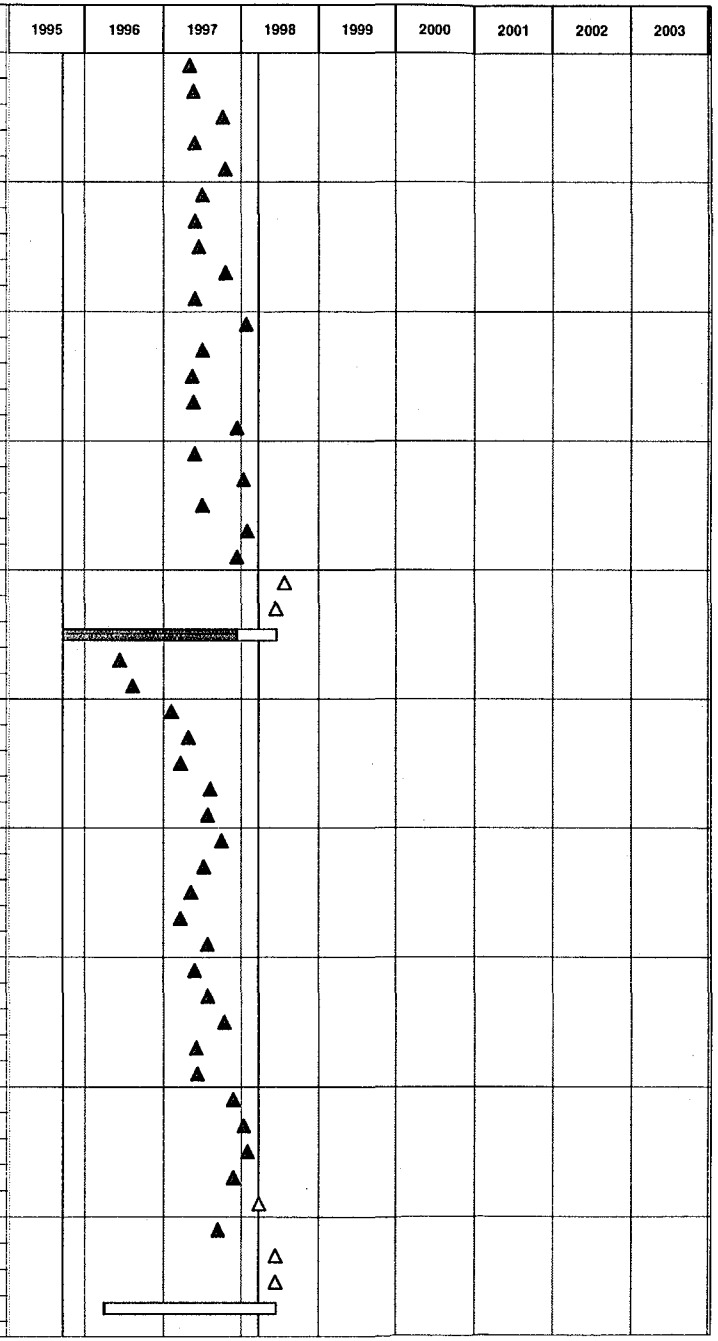
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11220.64	Complete Aero Design, Stage 7 Comp Stator - S	245300-100	5/6/97	5/6/97	0.02	100%	
11220.65	Complete Mech Design, Stage 7 Comp Stator - S	245300-100	5/23/97	5/23/97	0.02	100%	
11220.66	Appd CPD / Dwg, Stage 7 Comp Stator Vane - S	245301	10/13/97	10/13/97	0.03	100%	Late - Need 6-1-97 (Past Due)
11220.67	Need Dwg, Stage 7 Comp Stator Vane - S	245301	6/1/97	6/1/97	0	100%	
11220.68	Appd CPD / Dwg, Stage 7 Comp Stator Assy - S	245300	10/20/97	10/20/97	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.69	Need Dwg, Stage 7 Comp Stator Assy - S	245300	7/2/97	7/2/97	0	100%	
11220.70	Complete Aero Design, Stage 8 Comp Stator - S	245305-100	5/29/97	5/29/97	0.02	100%	
11220.71	Complete Mech Design, Stage 8 Comp Stator - S	245305-100	6/18/97	6/18/97	0.02	100%	
11220.72	Appd CPD / Dwg, Stage 8 Comp Stator Vane - S	245306	10/21/97	10/21/97	0.03	100%	Late - Need 6-1-97 (Past Due)
11220.73	Need Dwg, Stage 8 Comp Stator Vane - S	245306	6/1/97	6/1/97	0	100%	
11220.74	Appd CPD / Dwg, Stage 8 Comp Stator Assy - S	245305	1/30/98	1/30/98	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.75	Need Dwg, Stage 8 Comp Stator Assy - S	245305	7/2/97	7/2/97	0	100%	
11220.76	Complete Aero Design, Stage 9 Comp Stator - S	245310-100	5/20/97	5/20/97	0.02	100%	
11220.77	Complete Mech Design, Stage 9 Comp Stator - S	245310-100	5/21/97	5/21/97	0.02	100%	
11220.78	Appd CPD / Dwg, Stage 9 Comp Stator Vane - S	245311	12/19/97	12/19/97	0.03	100%	Late - Need 6-1-97 (Past Due)
11220.79	Need Dwg, Stage 9 Comp Stator Vane - S	245311	6/1/97	6/1/97	0	100%	
11220.80	Appd CPD / Dwg, Stage 9 Comp Stator Assy - S	245310	1/15/98	1/15/98	0.03	100%	Late - Need 7-2-97 (Past Due)
11220.81	Need Dwg, Stage 9 Comp Stator Assy - S	245310	7/2/97	7/2/97	0	100%	
11220.82	Appd CPD / Dwg, Compsr Casing / Stator Assy - S	245230	2/3/98	2/3/98	0.03	100%	
11220.83	Need Dwg, Compsr Casing / Stator Assy - S	245230	12/15/97	12/15/97	0	100%	
11220.84	Complete Assy, Compsr Casing / Stator Assy - S	245230-100	7/30/98	7/30/98	0.03	0%	Late - Need 6-15-98
11220.85	Need Assy, Compsr Casing / Stator Assy - S	245230-100	6/15/98	6/15/98	0	0%	
11240	**Compressor Diffuser / Bearing Assy - S**	**245330-100**	**9/14/95**	**6/15/98**	**0**	**82%**	
11240.1	Start DLA, Comp Diffuser / Bearing Assy - S	245330-100	6/11/96	6/11/96	0.06	100%	
11240.2	Start CFD, Comp Diffuser / Bearing Assy - S	245330-100	8/13/96	8/13/96	0.06	100%	
11240.3	Complete CFD, Comp Diffuser / Bearing Assy - S	245330-100	2/11/97	2/11/97	0.06	100%	
11240.4	Appd Casting CPD / Dwg, Comp Discharge Hsg - S	245361	4/30/97	4/30/97	0.06	100%	Late - Need 3-24-97 (Past Due)
11240.5	Need Casting Dwg, Comp Discharge Hsg - S	245361	3/24/97	3/24/97	0	100%	Past Due
11240.6	Release Machine Dwg, Comp Discharge Hsg - S	245360	8/13/97	8/13/97	0.06	100%	Late - Need 7-29-97 (Past Due)
11240.7	Need Machine Dwg, Comp Discharge Hsg - S	245360	7/29/97	7/29/97	0	100%	
11240.8	Appd CPD / Dwg, Comp Diffuser Inner - S	245331	10/3/97	10/3/97	0.07	100%	Late - Need 7-11-97 (Past Due)
11240.9	Need Dwg, Comp Diffuser Inner - S	245331	7/11/97	7/11/97	0	100%	
11240.10	Appd Casting CPD / Dwg, #2 Bearing Case - S	245334	5/12/97	5/12/97	0.06	100%	Late - Need 3-26-97 (Past Due)
11240.11	Need Casting Dwg, #2 Bearing Case - S	245334	3/26/97	3/26/97	0	100%	Past Due
11240.12	Appd Maching CPD / Dwg, #2 Bearing Case - S	245333	7/30/97	7/30/97	0.07	100%	Late - Need 6-1-97 (Past Due)
11240.13	Need Maching Dwg, #2 Bearing Case - S	245333	6/1/97	6/1/97	0	100%	
11240.14	Appd CPD / Dwg, #2 Bearing Case Assy - S	245333	7/30/97	7/30/97	0.07	100%	
11240.15	Need Dwg, #2 Bearing Case Assy - S	245333	10/15/97	10/15/97	0	100%	
11240.16	Complete Aero Design, Compsr OGV - S	245315-100	6/3/97	6/3/97	0.06	100%	
11240.17	Complete Mech Design, Compsr OGV - S	245315-100	6/12/97	6/12/97	0.06	100%	
11240.18	Appd CPD / Dwg, Compsr OGV Vane - S	245319	11/28/97	11/28/97	0.06	100%	Late - Need 5-2-97 (Past Due)
11240.19	Need Dwg, Compsr OGV Vane - S	245319	1/15/98	1/15/98	0	100%	
11240.20	Appd CPD / Dwg, Compsr OGV Assy - S	245315	2/3/98	2/3/98	0.07	100%	Late - Need 5-2-97 (Past Due)
11240.21	Need Dwg, Compsr OGV Assy - S	245315	11/28/97	11/28/97	0	100%	
11240.22	Appd Assy CPD / Dwg, Comp Diffuser / Bearing Assy	245330	4/1/98	4/1/98	0.07	0%	Late - Need 9-16-97 (Past Due)
11240.23	Need Assy Dwg, Comp Diffuser / Bearing Assy - S	245330	9/16/97	9/16/97	0	100%	
11240.24	Complete Assy, Comp Diffuser / Bearing Assy - S	245330-100	6/15/98	6/15/98	0.11	0%	Critical - Need 6-15-98
11240.25	Need Assy, Comp Diffuser / Bearing Assy - S	245330-100	6/15/98	6/15/98	0	0%	
11250	Compressor Common Parts - S	245050-100	4/1/96	6/15/98	0	1%	



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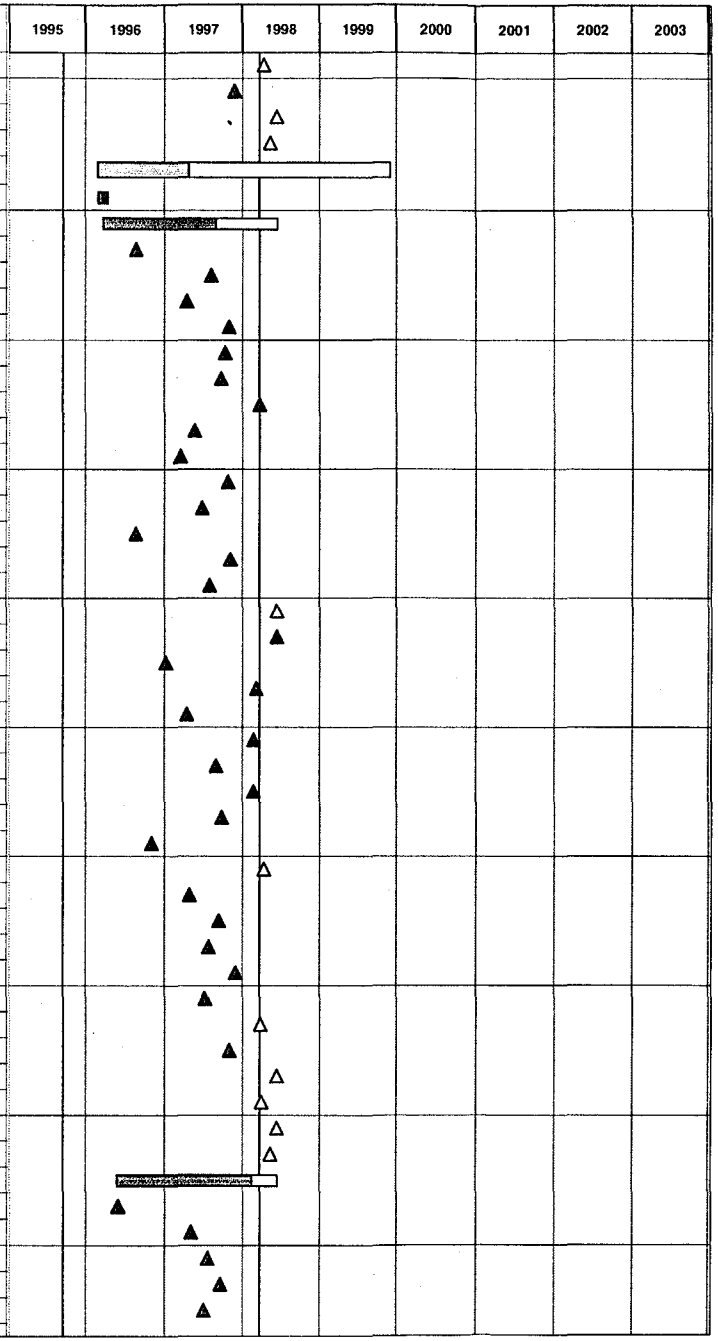
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11250.1	Appd CPD / Dwg, Compressor Common Parts - S	245050	4/15/98	4/15/98	0.75	0%	Late - Need 11-30-97
11250.2	Need Dwg, Compressor Common Parts - S	245050	11/30/97	11/30/97	0	100%	
11250.3	Complete, Compressor Common Parts - S	245050-100	6/15/98	6/15/98	0.25	0%	Late - Need 5-15-98
11250.4	Need, Compressor Common Parts - S	245050-100	5/15/98	5/15/98	0	0%	
11300	**Combustor System - S**		**2/28/96**	**12/1/99**	**0**	**31%**	
11310	Combustor Inlet Scroll (Req'mt deleted)		2/28/96	4/10/96	0	100%	
11320	**Combustor Assy - S**	**245450-100**	**3/26/96**	**6/15/98**	**0**	**65%**	
11320.1	Complete CFD, Combustor Housing - S	245450-100	8/21/96	8/21/96	0.03	100%	
11320.2	Appd Casting CPD / Dwg, Combustor Housing Assy -	245460	8/13/97	8/13/97	0.05	100%	Late - Need 4/18/97 (Past Due)
11320.3	Need Casting Dwg, Combustor Housing Assy - S	245460	4/18/97	4/18/97	0	100%	Past Due
11320.4	Appd Machine CPD / Dwg, Combustor Housing Assy -	245459	11/6/97	11/6/97	0.05	100%	
11320.5	Need Machine Dwg, Combustor Housing Assy - S	245459	10/16/97	10/16/97	0	100%	
11320.6	Appd CPD / Dwg, Combustor Hsg Assy - S	245459	9/29/97	9/29/97	0.05	100%	
11320.7	Need Dwg, Combustor Hsg Assy - S	245459	3/31/98	3/31/98	0	100%	
11320.7a	Appd Casting CPD / Dwg, Combustor End Cover - S	245257	5/23/97	5/23/97	0.03	100%	Late - Need 3-18-97 (Past Due)
11320.7b	Need Casting Dwg, Combustor End Cover - S	245457	3/18/97	3/18/97	0	100%	Past Due
11320.8	Appd CPD / Dwg, Combustor End Cover - S	245458	10/31/97	10/31/97	0.02	100%	Late - Need 6-30-97 (Past Due)
11320.9	Need Dwg, Combustor End Cover - S	245458	6/30/97	6/30/97	0	100%	
11320.10	Start DLA, Air Diverter Valve Assy - S	245510-100	8/21/96	8/21/96	0.02	100%	
11320.11	Appd CPD / Dwg, Air Diverter Valve Assy - S	245510	11/10/97	11/10/97	0.05	100%	Late - Need 8-6-97 (Past Due)
11320.12	Need Dwg, Air Diverter Valve Assy - S	245510	8/6/97	8/6/97	0	100%	
11320.13	Complete Assy, Air Diverter Valve Assy - S	245510-100	6/15/98	6/15/98	0.05	0%	Critical - Need 6-15-98
11320.14	Need Assy, Air Diverter Valve Assy - S	245510-100	6/15/98	6/15/98	0	100%	
11320.15	Start DLA, Stage 1 Diaphragm - S	245470-100	1/7/97	1/7/97	0.03	100%	
11320.16	Appd Casting CPD / Dwg, Stage 1 Diaphragm - S	245471	3/9/98	3/9/98	0.05	100%	Late - Need 4-16-97 (Past Due)
11320.17	Need Casting Dwg, Stage 1 Diaphragm - S	245471	4/16/97	4/16/97	0	100%	Past Due
11320.18	Appd Machine CPD / Dwg, Stage 1 Diaphragm - S	245470-1	2/25/98	2/25/98	0.05	100%	Late - Need 8-15-97 (Past Due)
11320.19	Need Machine Dwg, Stage 1 Diaphragm - S	245470-1	9/4/97	9/4/97	0	100%	
11320.20	Appd CPD / Dwg, Stage 1 Diaphragm Assy - S	245470-100	2/25/98	2/25/98	0.05	100%	
11320.21	Need Dwg, Stage 1 Diaphragm Assy - S	245470-100	9/30/97	9/30/97	0	100%	
11320.22	Start DLA, Turbine Preswirler Stg 1 - S	245472-1	11/1/96	11/1/96	0.02	100%	
11320.23	Appd CPD / Dwg, Piston Ring Preswirler Stg 1 - S	245475	4/15/98	4/15/98	0.05	0%	Late - On Design Hold
11320.24	Need Dwg, Piston Ring Preswirler Stg 1 - S	245475	4/26/97	4/26/97	0	100%	Past Due
11320.27	Appd Casting CPD / Dwg, Turbine Preswirler Stg 1 - S	245473	9/13/97	9/13/97	0.10	100%	Late - Need 7-27-97 (Past Due)
11320.28	Need Casting Dwg, Turbine Preswirler Stg 1 - S	245473	7/27/97	7/27/97	0	100%	
11320.29	Appd CPD / Dwg, Turbine Preswirler Stg 1 - S	245472	12/4/97	12/4/97	0.05	100%	Late - Need 7-11-97 (Past Due)
11320.30	Need Dwg, Turbine Preswirler Stg 1 - S	245472	7/11/97	7/11/97	0	100%	
11320.31	Appd CPD / Dwg, Combustor Assy - S	245450	4/1/98	4/1/98	0.05	0%	Late - Need 11-5-97
11320.32	Need Dwg, Combustor Assy - S	245450	11/5/97	11/5/97	0	100%	
11320.33	Complete Assy, Combustor Housing - S	245459-100	6/15/98	6/15/98	0.05	0%	Late - Need 4-4-98
11320.34	Need Assy, Combustor Housing - S	245459-100	4/4/98	4/4/98	0	0%	
11320.35	Complete Assy, Combustor Assembly - S	245450-100	6/15/98	6/15/98	0.15	0%	Late - Need 5-15-98
11320.36	Need Assy, Combustor Assembly - S	245450-100	5/15/98	5/15/98	0	0%	
11330	LPM Combustor Liner Assy - S	245480-100	5/28/96	6/15/98	0	85%	
11330.1	Start DLA, Combustor Liner Assy - S	245480-100	5/28/96	5/28/96	0.10	100%	
11330.2	Complete DLA, Combustor Liner Assy - S	245480-100	5/5/97	5/5/97	0.15	100%	
11330.3	Appd CPD / Dwg, Combustor Liner Details - S	245480	7/25/97	7/25/97	0.25	100%	
11330.4	Appd CPD / Dwg, Combustor Liner Assy - S	245480	9/23/97	9/23/97	0.25	100%	Late - Need 7-7-97 (Past Due)
11330.5	Need Dwg, Combustor Liner Assy - S	245480	7/7/97	7/7/97	0	100%	



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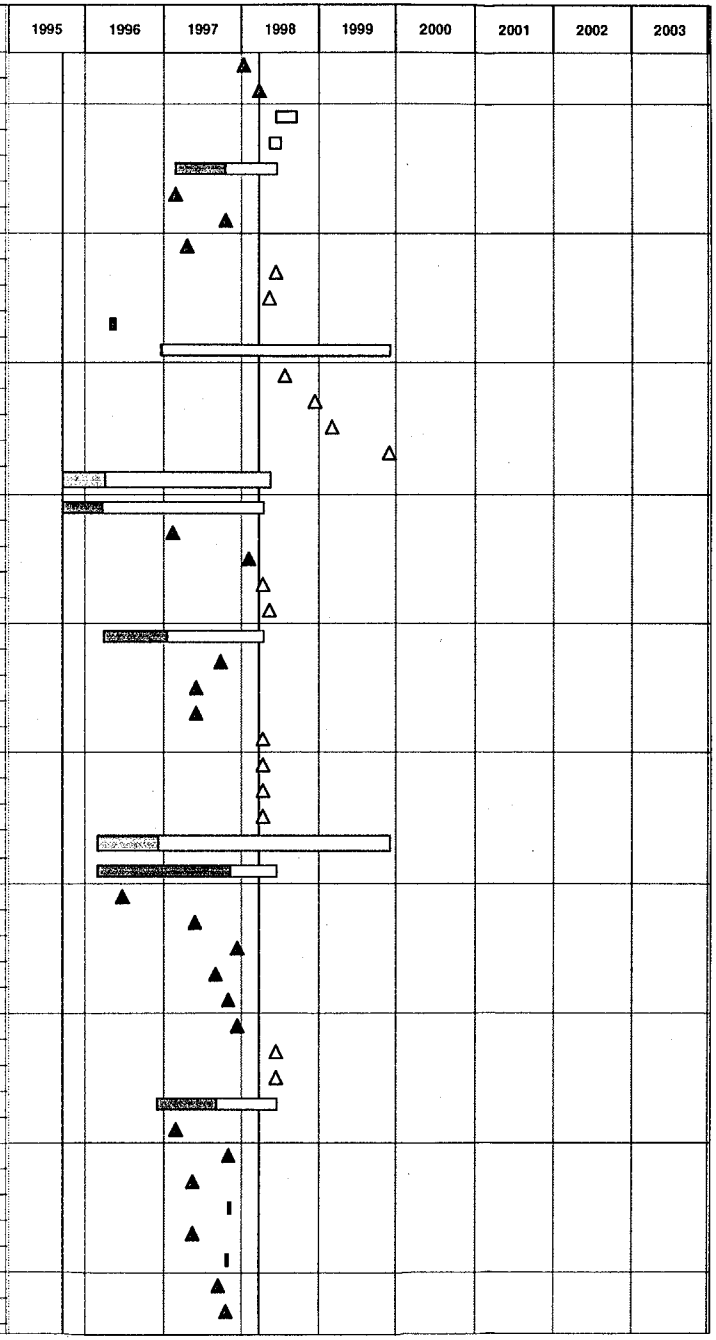
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11330.6	Complete Assy, Combustor Liner Assy - S (Rig)	Rig Part	1/15/98	1/15/98	0.10	100%	
11330.7	Need Assy, Combustor Liner Assy - S (Rig)	Rig Part	3/31/98	3/31/98	0	100%	
11330.8	Complete Assy, Combustor Liner Assy - S (Prod)	245480-100	6/15/98	9/15/98	0.15	0%	Late - Need 5-15-98
11330.9	Need Assy, Combustor Liner Assy - S (Prod)	245480-100	5/15/98	7/2/98	0	0%	
11340	**Ignitor Torch Assy - S**	**245497-100**	**3/1/97**	**6/15/98**	**0**	**50%**	
11340.1	Start DLA, Ignitor Torch Assy - S	245497-100	2/28/97	2/28/97	0.10	100%	
11340.2	Appd CPD / Dwg, Ignitor Torch Assy - S	245497	10/23/97	10/23/97	0.40	100%	Late - Need 4-24-97 (Past Due)
11340.3	Need Dwg, Ignitor Torch Assy - S	245497	4/24/97	4/24/97	0	100%	Past Due
11340.4	Complete Assy, Ignitor Torch Assy - S	245497-100	6/15/98	6/15/98	0.50	0%	Late - Need 5-15-98
11340.5	Need Assy, Ignitor Torch Assy - S	245497-100	5/15/98	5/15/98	0	0%	
11350	Combustor Outlet Scroll (Req'mt deleted)		5/1/96	5/15/96	0	100%	
11360	**Catalytic Combustor Liner Assy - S**		**12/19/96**	**12/1/99**	**0**	**1%**	
11360.1	Appd CPD / Dwg, Catalytic Liner Assy - S		7/28/98	7/28/98	0.25	0%	
11360.2	Select, Catalytic Concept - S		12/15/98	12/15/98	0.25	0%	
11360.3	Appd CPD / Dwg, Catalytic Liner S		3/3/99	3/3/99	0.25	0%	
11360.4	Complete Fab, Catalytic Liner S Rig		12/1/99	12/1/99	0.25	0%	
11400	**Recuperator Section - S**		**9/14/95**	**5/15/98**	**0**	**21%**	
11410	**Recuperator Assembly - S**	**245900-100**	**9/14/95**	**4/15/98**	**0**	**20%**	
11410.1	Appd CPD / Dwg, Recuperator Assy- S	245900	2/15/97	2/15/97	0.20	100%	
11410.2	Complete Assy, Recuperator Assy - S (19B5)	245900-100	2/9/98	2/9/98	0.30	100%	
11410.3	Complete Assy, Recuperator Assy -S	245900-100	4/15/98	4/15/98	0.50	0%	
11410.4	Need Assy, Recuperator Assy -S	245900-100	5/15/98	5/15/98	0	0%	
11420	**Recuperator Piping - S**		**4/1/96**	**4/15/98**	**0**	**40%**	
11420.1	Appd CPD / Dwg, Recup Air Inlet Assy - S	245901	9/30/97	9/30/97	0.15	100%	
11420.2	Appd CPD / Dwg, Recup Air Outlet Exp Joint Assy - S	245902	6/7/97	6/7/97	0.12	100%	
11420.3	Appd CPD / Dwg, Recup Gas Inlet Flex Duct Assy - S	245903	6/7/97	6/7/97	0.13	100%	
11420.4	Complete Fab, Recuperator Air Inlet Assy Left - S	245901-100	4/15/98	4/15/98	0.15	0%	
11420.5	Complete Fab, Recuperator Air Inlet Assy Right - S	245901-200	4/15/98	4/15/98	0.15	0%	
11420.6	Complete Fab, Recup Air Outlet Exp. Joint Assy - S	245902-100	4/15/98	4/15/98	0.15	0%	
11420.7	Complete Fab, Recup Gas Inlet Flex Duct Assy -S	245903-100	4/15/98	4/15/98	0.15	0%	
11500	**Gas Fuel Assembly - S**	**245500-100**	**2/28/96**	**11/30/9**	**0**	**21%**	
11510	**Fuel Injector Assy - S**	**245515-100**	**2/28/96**	**6/15/98**	**0**	**75%**	
11510.1	Start DLA, Fuel Injector Assy - S	245515-100	6/24/96	6/24/96	0.10	100%	
11510.2	Complete CFD, Fuel Injector Assy - S	245515-100	5/30/97	5/30/97	0.15	100%	
11510.3	Appd CPD / Dwg, Fuel Injector Assy, Fabricated - S	246260	12/15/97	12/15/97	0.25	100%	Late - Need 9-5-97
11510.4	Need Dwg, Fuel Injector Assy Fabricated - S	246260	9/5/97	9/5/97	0	100%	
11510.5	Appd CPD / Dwg, Gas Fuel Assy - S	245500	11/3/97	11/3/97	0.25	100%	
11510.6	Need Dwg, Gas Fuel Assy - S	245500	12/15/97	12/15/97	0	100%	
11510.7	Complete Assy, Fuel Injector Assy, Fabricated - S	245285-100	6/15/98	6/15/98	0.25	0%	Critical - Need 6/15/98
11510.8	Need Assy, Fuel Injector Assy - S	245285-100	6/15/98	6/15/98	0	0%	
11520	**Fuel Manifolds / Tube Assy - S**	**Various**	**12/5/96**	**6/15/98**	**0**	**50%**	
11520.1	Start DLA, Fuel Manifolds / Tube Assy - S	Various	3/1/97	3/1/97	0.10	100%	
11520.2	Appd CPD / Dwg, Manifold Assy, Gas (Main) - S	245520	11/3/97	11/3/97	0.10	100%	Late - Need 5-18-97 (Past Due)
11520.3	Need Dwg, Manifold Assy, Gas (Main) - S	245520	5/18/97	5/18/97	0	100%	
11520.4	Appd CPD / Dwg, Manifold Assy, Gas (Pilot) - S	245495	11/3/97	11/3/97	0.10	100%	Late - Need 5-18-97 (Past Due)
11520.5	Need Dwg, Manifold Assy, Gas (Pilot) - S	245495	5/18/97	5/18/97	0	100%	
11520.6	Appd CPD / Dwg, Tube Assy, Gas (Main) - S	245521	10/22/97	10/22/97	0.10	100%	Late - Need 9-15-97 (Past Due)
11520.7	Need Dwg, Tube Assy, Gas (Main) - S	245521	9/15/97	9/15/97	0	100%	
11520.8	Appd CPD / Dwg, Tube Assy, Gas (Pilot) - S	245526	10/22/97	10/22/97	0.10	100%	Late - Need 9-15-97 (Past Due)



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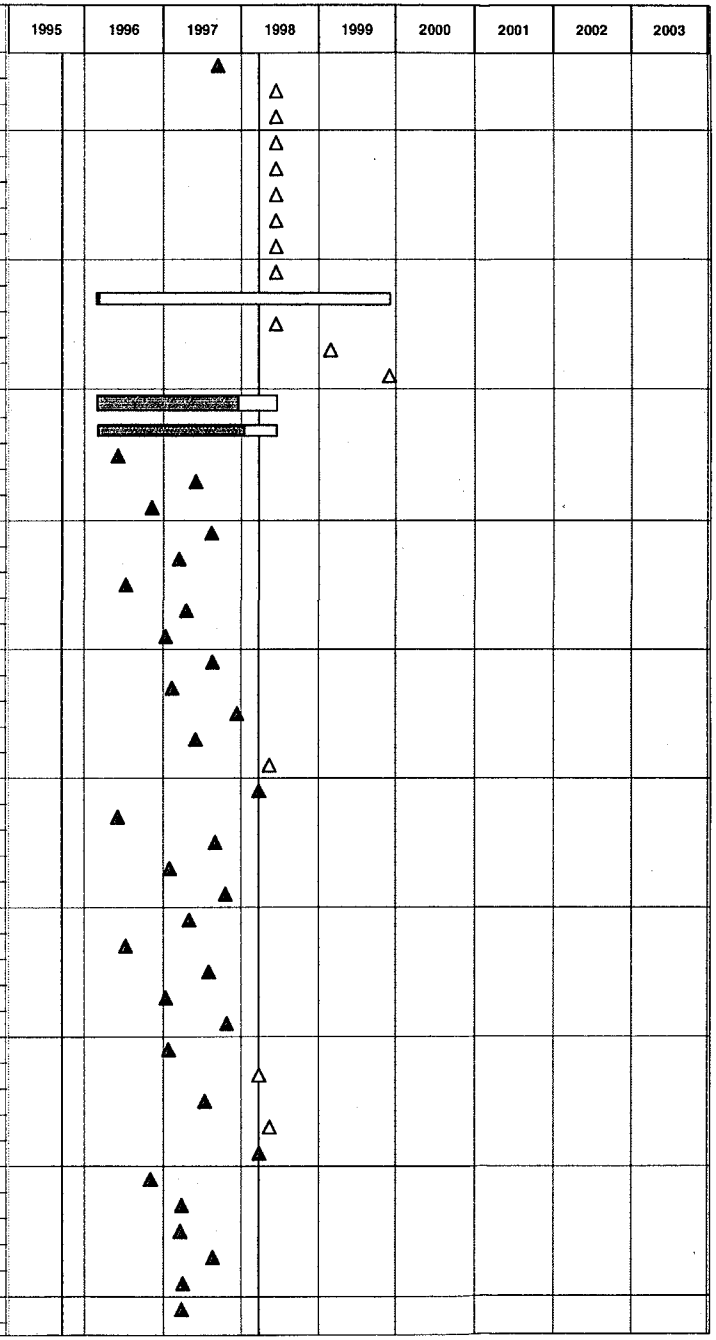
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11520.9	Need Dwg, Tube Assy, Gas (Pilot) - S	245526	9/15/97	9/15/97	0	100%	
11520.10	Complete Assy, Manifold Assy, Gas (Main) - S	245520-100	6/15/98	6/15/98	0.15	0%	Critical - Need 6-15-98
11520.11	Need Assy, Manifold Assy, Gas (Main) - S	245520-100	6/15/98	6/15/98	0	0%	
11520.12	Complete Assy, Manifold Assy, Gas (Pilot) - S	245525-100	6/15/98	6/15/98	0.15	0%	Critical - Need 6-15-98
11520.13	Need Assy, Manifold Assy, Gas (Pilot) - S	245525-100	6/15/98	6/15/98	0	0%	
11520.14	Complete Assy, Tube Assy, Gas (Main) - S	245521-100	6/15/98	6/15/98	0.10	0%	Critical - Need 6-15-98
11520.15	Need Assy, Tube Assy, Gas (Main) - S	245521-100	6/15/98	6/15/98	0	0%	
11520.16	Complete Assy, Tube Assy, Gas (Pilot) - S	245526-100	6/15/98	6/15/98	0.10	0%	Critical - Need 6-15-98
11520.17	Need Assy, Tube Assy, Gas (Pilot) - S	245526-100	6/15/98	6/15/98	0	0%	
11530	**Fuel Injector, Catalytic - S**		**3/1/96**	**11/30/99**	**0**	**1%**	
11530.1	Appd CPD / Dwg, Catalytic Rig Fuel Injector - S		6/15/98	6/15/98	0.15	0%	
11530.2	Appd CPD / Dwg, Catalytic Fuel Injector - S		3/2/99	3/2/99	0.45	0%	
11530.3	Complete Fab, Catalytic Fuel Injector - S		11/30/99	11/30/99	0.40	0%	
11600	**Turbine Section - S**		**3/1/96**	**6/15/98**	**0**	**79%**	
11610	**Turbine Rotor Assy - S**	**245700-100**	**3/7/96**	**6/15/98**	**0**	**83%**	
11610.1	Start DLA, Stage 1 Blade - S	245710-100	6/3/96	6/3/96	0.02	100%	
11610.2	Appd Casting CPD / Dwg, Stage 1 Blade - S	245711	6/5/97	6/5/97	0.03	100%	Late - Need 11-7-96 (Past Due)
11610.3	Need Casting Dwg, Stage 1 Blade - S	245711	11/7/96	11/7/96	0	100%	Past Due
11610.4	Appd Machine CPD / Dwg, Stage 1 Blade - S	245710	8/18/97	8/18/97	0.03	100%	Late Need 3-18-97 (Past Due)
11610.5	Need Machine Dwg, Stage 1 Blade - S	245710	3/18/97	3/18/97	0	100%	Past due
11610.6	Start DLA, Stage 1 Disk - S	245702-1	7/8/96	7/8/96	0.02	100%	
11610.7	Appd Forging CPD / Dwg, Stage 1 Disk - S	245703	4/21/97	4/21/97	0.03	100%	
11610.8	Need Forging Dwg, Stage 1 Disk - S	245703	1/17/97	1/17/97	0	100%	
11610.9	Appd Machining CPD / Dwg, Stage 1 Disk - S	245702	8/22/97	8/22/97	0.03	100%	Late - Need 2-16-97 (Past Due)
11610.10	Need Machining Dwg, Stage 1 Disk - S	245702	2/16/97	2/16/97	0	100%	Past Due
11610.11	Appd CPD / Dwg, Stage 1 Disk Assy - S	245701	12/18/97	12/18/97	0.03	100%	Late - Need 6-2-97 (Past Due)
11610.12	Need Dwg, Stage 1 Disk Assy - S	245701	6/2/97	6/2/97	0	100%	
11610.13	Complete Assy, Stage 1 Disk Assy - S	245701-100	5/15/98	5/15/98	0.03	0%	Late - Need 3-30-98
11610.14	Need Assy, Stage 1 Disk Assy - S	245701-100	3/30/98	3/30/98	0	100%	
11610.15	Start DLA, Stage 2 Blade - S	245760-1	6/3/96	6/3/96	0.02	100%	
11610.16	Appd CPD / Dwg, Stage 2 Blade - S	245761	9/4/97	9/4/97	0.03	100%	Late - Need 2-5-97 (Past Due)
11610.17	Need Casting Dwg, Stage 2 Blade - S	245761	2/5/97	2/5/97	0	100%	Past Due
11610.18	Appd Machine CPD / Dwg, Stage 2 Blade - S	245760	10/23/97	10/23/97	0.03	100%	Late - Need 5-7-97 (Past Due)
11610.19	Need Machine Dwg, Stage 2 Blade - S	245760	5/7/97	5/7/97	0	100%	
11610.20	Start DLA, Stage 2 Disk - S	245751-1	7/12/96	7/12/96	0.02	100%	
11610.21	Appd Forging CPD / Dwg, Stage 2 Disk - S (EI)	245752	8/5/97	8/5/97	0.03	100%	Late - Need 1-14-97 (Past Due)
11610.22	Need Forging Dwg, Stage 2 Disk - S	245752	1/14/97	1/14/97	0	100%	Past Due
11610.23	Appd Machine CPD / Dwg, Stage 2 Disk - S	245751	10/30/97	10/30/97	0.03	100%	Late - Need 1-29-97 (Past Due)
11610.24	Need Machine Dwg, Stage 2 Disk - S	245751	1/29/97	1/29/97	0	100%	Past Due
11610.25	Appd CPD / Dwg, Stage 2 Disk Assy - S	245750	4/1/98	4/1/98	0.03	0%	Late - Need 7-17-97 (Past Due)
11610.26	Need Dwg, Stage 2 Disk Assy - S	245750	7/17/97	7/17/97	0	100%	
11610.27	Complete Assy, Stage 2 Disk Assy - S	245750-100	5/15/98	5/15/98	0.03	0%	Late - Need 3-30-98
11610.28	Need Assy, Stage 2 Disk Assy - S	245750-100	3/30/98	3/30/98	0	100%	
11610.29	Start DLA, Turbine Rim Seals - S	Various	11/1/96	11/1/96	0.02	100%	
11610.30	Appd Forging CPD / Dwg, Turbine Rim Seal, Fwd - S	245721	4/1/97	4/1/97	0.03	100%	Late - Need 3-23-97 (Past Due)
11610.31	Need Forging Dwg, Turbine Rim Seal, Fwd - S	245721	3/23/97	3/23/97	0	100%	Past Due
11610.32	Appd Mach CPD / Dwg, Turbine Rim Seal, Fwd - S	245720-1	8/22/97	8/22/97	0.03	100%	Late - Need 4-2-97 (Past Due)
11610.33	Need Mach Dwg, Turbine Rim Seal, Fwd - S	245720-1	4/2/97	4/2/97	0	100%	Past Due
11610.34	Appd Forging CPD / Dwg, Turbine Rim Seal, Aft - S	245731	4/1/97	4/1/97	0.03	100%	Late - Need 3-23-97 (Past Due)



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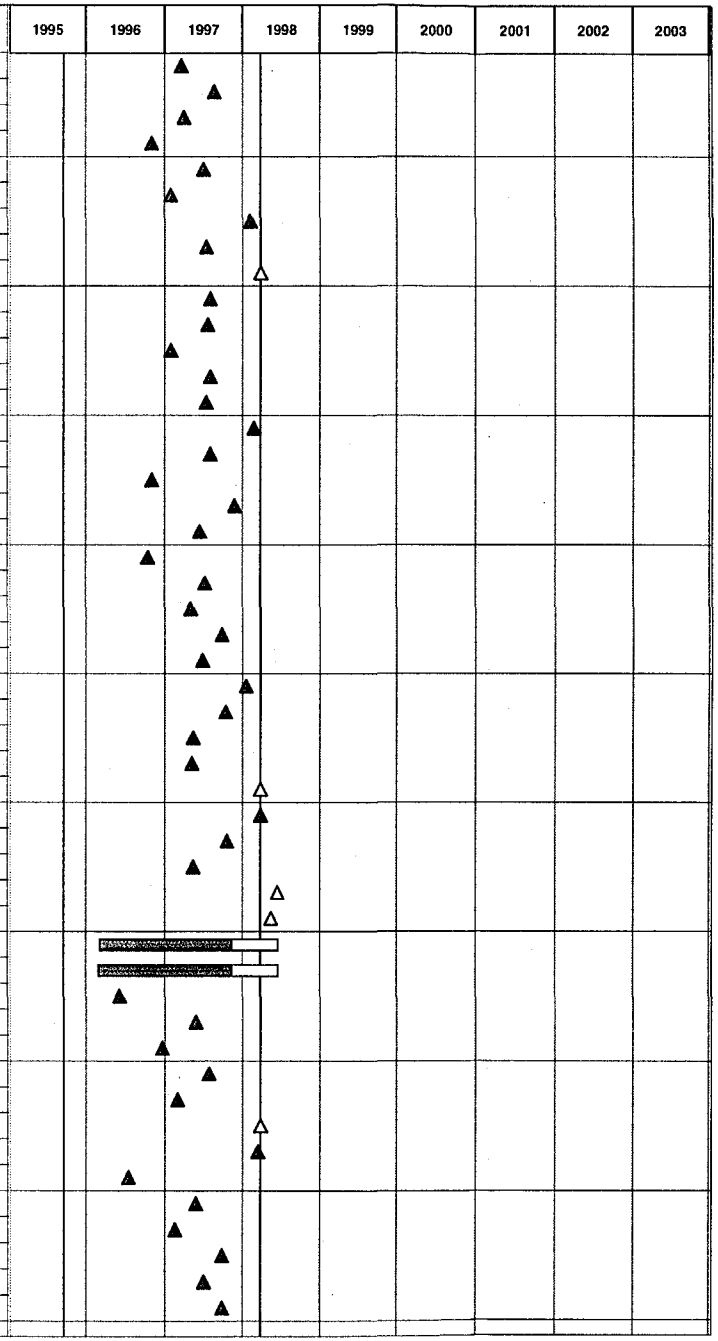
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11610.35	Need Forging Dwg, Turbine Rim Seal, Aft - S	245731	3/23/97	3/23/97	0	100%	Past due
11610.36	Appd Machine CPD / Dwg, Turbine Rim Seal, Aft - S	245720-2	8/22/97	8/22/97	0.03	100%	Late - Need 4-2-96 (Past Due)
11610.37	Need Mach Dwg, Turbine Rim Seal, Aft - S	245720-2	4/2/97	4/2/97	0	100%	Past Due
11610.38	Start DLA, Turbine Shaft Assy - S	Various	11/4/96	11/4/96	0.02	100%	
11610.39	Appd Forging CPD / Dwg, Turbine Shaft Assy - S	245777	7/2/97	7/2/97	0.03	100%	Late - Need 2-4-97 (Past Due)
11610.40	Need Forging Dwg, Turbine Shaft Assy - S	245777	2/4/97	2/4/97	0	100%	Past Due
11610.41	Appd Machine CPD / Dwg, Turb. Shaft Assy - S	245776	2/10/98	2/10/98	0.03	100%	Late - Need 7-20-97 (Past Due)
11610.42	Need Machine Dwg, Turbine Shaft Assy - S	245776	7/20/97	7/20/97	0	100%	
11610.43	Appd CPD / Dwg, Turbine Shaft Assy - S	245775	4/1/98	4/1/98	0.03	0%	Late - Need 8-7-97 (Past Due)
11610.44	Need Dwg, Turbine Shaft Assy - S	245775	8/7/97	8/7/97	0	100%	
11610.45	Appd Forging CPD / Dwg, Turbine Shaft Assy, Center	245792	7/24/97	7/24/97	0.03	100%	Late - Need 2-4-97 (Past Due)
11610.46	Need Forging Dwg, Turbine Shaft Assy, Center - S	245792	2/4/97	2/4/97	0	100%	Past Due
11610.47	Appd Machine CPD / Dwg, Turbine Shaft Fwd, Center	245791	8/7/97	8/7/97	0.03	100%	
11610.48	Need Machine Dwg, Turbine Shaft Fwd, Center - S	245791	7/20/97	7/20/97	0	100%	
11610.49	Appd CPD / Dwg, Turbine Shaft Aft, Center - S	245793	3/2/98	3/2/98	0.03	100%	Late - Need 8-7-97 (Past Due)
11610.50	Need Dwg, Turbine Shaft Aft, Center - S	245793	8/7/97	8/7/97	0	100%	
11610.51	Start DLA, Tiebolt - S	245740-1	11/4/96	11/4/96	0.02	100%	
11610.52	Appd CPD / Dwg, Tiebolt - S	245740	11/25/97	11/25/97	0.03	100%	Late - Need 6-17-97 (Past Due)
11610.53	Need Dwg, Tiebolt - S	245740	6/17/97	6/17/97	0	100%	
11610.54	Start DLA, #3 Bearing Case Assy - S	245800-100	10/16/96	10/16/96	0.02	100%	
11610.55	Appd Casting CPD / Dwg, #3 Bearing Case - S	245807	7/11/97	7/11/97	0.02	100%	Late - Need 5-5-97 (Past Due)
11610.56	Need Casting Dwg, #3 Bearing Case - S	245807	5/5/97	5/5/97	0	100%	
11610.57	Appd Machine CPD / Dwg, #3 Bearing Case Assy - S	245806	9/26/97	9/26/97	0.02	100%	Late - Need 6-16-97 (Past Due)
11610.58	Need Machine Dwg, #3 Bearing Case Assy - S	245806	6/30/97	6/30/97	0	100%	
11610.59	Appd CPD / Dwg, #3 Bearing Case Assy - S	245800	1/21/98	1/21/98	0.02	100%	
11610.60	Need Dwg, #3 Bearing Case Assy - S	245800	10/16/97	10/16/97	0	100%	
11610.61	Appd CPD / Dwg, Thrust Bearing Assy - S	245555	5/16/97	5/16/97	0.02	100%	
11610.62	Procure, Thrust Bearing Assy - S	245555-100	5/10/97	5/10/97	0	100%	
11610.63	Appd CPD / Dwg, Turbine Rotor Assy - S	245700	4/1/98	4/1/98	0.02	0%	Critical - Need 4-1-98
11610.64	Need Dwg, Turbine Rotor Assy - S	245700	4/1/98	4/1/98	0	100%	
11610.65	Appd CPD / Dwg, Exhaust Collector Inner - S	245801	10/22/97	10/22/97	0.02	100%	Late - Need 5-18-97 (Past Due)
11610.66	Need Dwg, Exhaust Collector Inner - S	245801	5/18/97	5/18/97	0	100%	Past Due
11610.67	Complete Assy, Turbine Rotor Assy - S	245700-100	6/15/98	6/15/98	0.03	0%	Late - Need 5-15-98
11610.68	Need Assy, Turbine Rotor Assy - S	245700-100	5/15/98	5/15/98	0	0%	
11620	**Turbine Housing Assy - S**		3/7/96	6/15/98	0	75%	
11630	**Turbine Nozzle Assy -S**		3/1/96	6/15/98	0	75%	
11630.1	Start DLA, Nozzle Segment Assy Stg 1 - S	245600-100	6/3/96	6/3/96	0.05	100%	
11630.2	Appd Casting CPD / Dwg, Nozzle Segment Stg 1 - S	245602	5/30/97	5/30/97	0.10	100%	Late - Need 12-23-96 (Past Due)
11630.3	Need Casting Dwg, Nozzle Segment Stg 1 - S	245602	12/23/96	12/23/96	0	100%	Past Due
11630.4	Appd Machine CPD / Dwg, Nozzle Segment Stg 1 - S	245601	7/30/97	7/30/97	0.05	100%	Late - Need 3-4-97 (Past Due)
11630.5	Need Machine Dwg, Nozzle Segment Stg 1 - S	245601	3/4/97	3/4/97	0	100%	Past due
11630.6	Appd Assy CPD / Dwg, Nozzle Segment Stg 1 - S	245600	4/1/98	4/1/98	0.10	0%	Late - Need 3-16-98
11630.7	Need Assy Dwg, Nozzle Segment Stg 1 - S	245600	3/16/98	3/16/98	0	100%	
11630.8	Start DLA, Stage 2 Nozzle Assy - S	245650-100	7/17/96	7/17/96	0.05	100%	
11630.9	Appd Casting CPD / Dwg, Stage 2 Nozzle Segment -	245652	5/30/97	5/30/97	0.10	100%	Late - Need 2-21-97 (Past Due)
11630.10	Need Casting Dwg, Stage 2 Nozzle Segment - S	245652	2/21/97	2/21/97	0	100%	Past Due
11630.11	Appd Machine CPD / Dwg, Stage 2 Nozzle Segment -	245651-100/200	9/25/97	9/25/97	0.05	100%	Late - Need 7-2-97 (Past Due)
11630.12	Need Machine Dwg, Stage 2 Nozzle Segment - S	245651-100/200	7/2/97	7/2/97	0	100%	
11630.13	Appd CPD / Dwg, Stage 2 Nozzle Assy - S	245650	9/25/97	9/25/97	0.05	100%	



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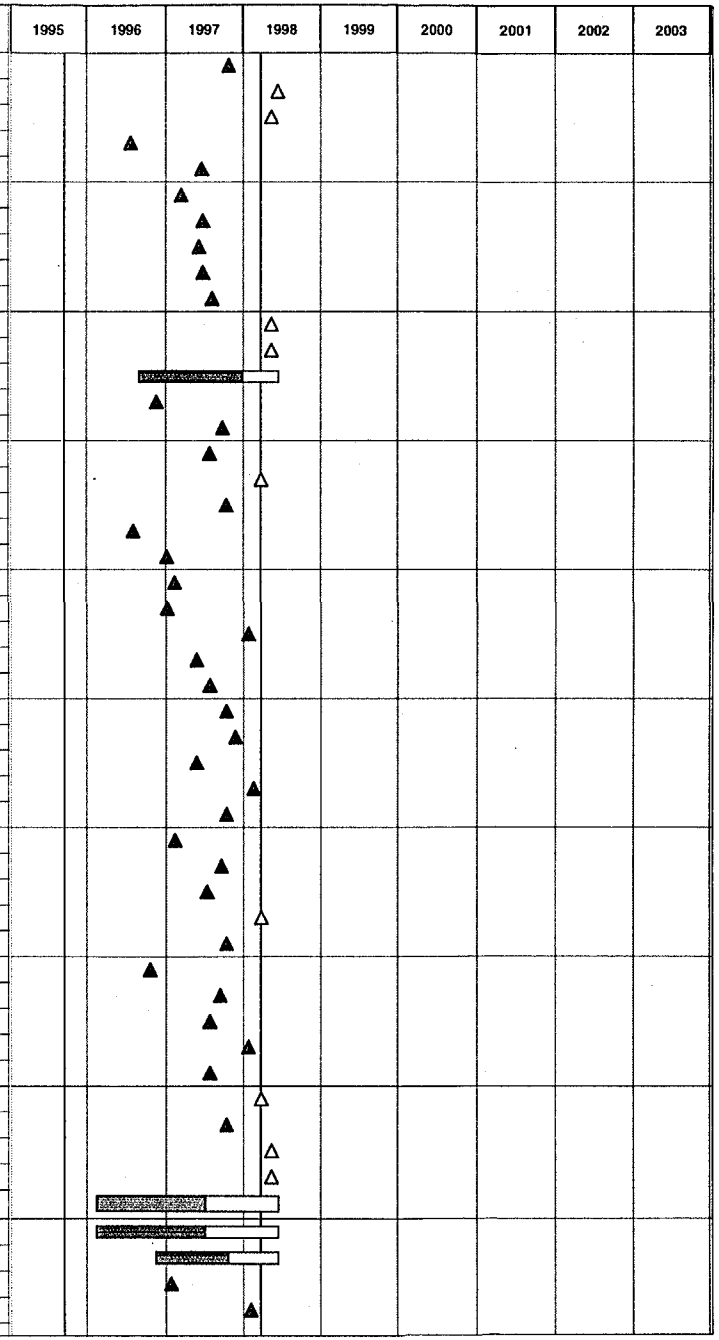
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11630.14	Need Dwg, Stage 2 Nozzle Assy - S	245650	10/31/97	10/31/97	0	100%	
11630.15	Complete Assy, Stage 2 Nozzle Assy - S	245650-100	6/15/98	6/15/98	0.05	0%	Late - Need 5-15-98
11630.16	Need Assy, Stage 2 Nozzle Assy - S	245650-100	5/15/98	5/15/98	0	0%	
11630.17	Start DLA, Stage 2 Diaphragm - S	245660-100	7/22/96	7/22/96	0.05	100%	
11630.18	Appd Forging CPD / Dwg, Stage 2 Diaphragm - S	245662	6/20/97	6/20/97	0.10	100%	Late - Need 3-15-97 (Past Due)
11630.19	Need Forging Dwg, Stage 2 Diaphragm - S	245662	3/15/97	3/15/97	0	100%	Past Due
11630.20	Appd Machine CPD / Dwg, Stage 2 Diaphragm - S	245661	7/1/97	7/1/97	0.05	100%	Late - Need 6-13-97 (Past Due)
11630.21	Need Machine Dwg, Stage 2 Diaphragm - S	245661	6/13/97	6/13/97	0	100%	
11630.22	Appd CPD / Dwg, Stage 2 Diaphragm Assy - S	245660	7/1/97	7/1/97	0.10	100%	
11630.23	Need Dwg, Stage 2 Diaphragm Assy - S	245660	8/13/97	8/13/97	0	100%	
11630.24	Complete Assy, Stage 2 Diaphragm Assy - S	245660-100	5/15/98	5/15/98	0.10	0%	Critical - Need 5-15-98
11630.25	Need Assy, Stage 2 Diaphragm Assy - S	245660-100	5/15/98	5/15/98	0	0%	
11640	**Turbine Common Parts -S**	**245550-100**	**9/2/96**	**6/15/98**	**0**	**75%**	
11640.1	Start DLA, Stage 1 Tipshoe - S	245580-100/500	11/20/96	11/20/96	0.05	100%	
11640.2	Appd Casting CPD / Dwg, Stage 1 Tipshoe - S	245581	9/25/97	9/25/97	0.05	100%	Late - Need 7-31-97 (Past Due)
11640.3	Need Casting Dwg, Stage 1 Tipshoe - S	245581	7/31/97	7/31/97	0	100%	
11640.4	Appd Machine CPD / Dwg, Stage 1 Tipshoe - S	245580	4/1/98	4/1/98	0.05	0%	Late - Need 10-15-97 (Past Due)
11640.5	Need Machine Dwg, Stage 1 Tipshoe - S	245580	10/15/97	10/15/97	0	100%	
11640.6	Start DLA, Nozzle Hsg Assy - S	245575-100/200	8/6/96	8/6/96	0.05	100%	
11640.7	Order Raw Material, Nozzle Hsg Assy - S	245577	1/9/97	1/9/97	0.05	100%	
11640.8	Appd Forging CPD / Dwg, Nozzle Hsg Assy - S	245577	2/13/97	2/13/97	0.05	100%	
11640.9	Need Forging Dwg, Nozzle Hsg Assy - S	245577	1/12/97	1/12/97	0	100%	
11640.10	Appd CPD / Dwg, Nozzle Hsg Assy - S	245576	1/30/98	1/30/98	0.05	100%	Late - Need 6-1-97 (Past Due)
11640.11	Need Dwg, Nozzle Hsg Assy - S	245576	6/1/97	6/1/97	0	100%	
11640.12	Appd CPD / Dwg, Turbine Nozzle Case Assy - S	245575	8/1/97	8/1/97	0.05	100%	
11640.13	Need Dwg, Turbine Nozzle Case Assy - S	245575	10/15/97	10/15/97	0	100%	
11640.14	Appd Forging CPD / Dwg, Nozzle Hsg Aft - S	245579	11/26/97	11/26/97	0.10	100%	Late - Need 5-28-97 (Past Due)
11640.15	Need Forging Dwg, Nozzle Hsg Aft - S	245579	5/28/97	5/28/97	0	100%	
11640.16	Appd CPD / Dwg, Nozzle Hsg Aft - S	245840	2/24/98	2/24/98	0.05	100%	Late - Need 10-15-97 (Past Due)
11640.17	Need Dwg, Nozzle Hsg Aft - S	245840	10/15/97	10/15/97	0	100%	
11640.18	Start DLA, Stage 2 Tipshoe - S	245570-100	2/13/97	2/13/97	0.05	100%	
11640.19	Appd Casting CPD / Dwg, Stage 2 Tipshoe - S	245571	9/22/97	9/22/97	0.05	100%	Late - Need 7-16-97 (Past Due)
11640.20	Need Casting Dwg, Stage 2 Tipshoe - S	245571	7/16/97	7/16/97	0	100%	
11640.21	Appd Machine CPD / Dwg, Stage 2 Tipshoe - S	245570	4/1/98	4/1/98	0.05	0%	Late - Need 10-15-97 (Past Due)
11640.22	Need Machine Dwg, Stage 2 Tipshoe - S	245570	10/15/97	10/15/97	0	100%	
11640.23	Start DLA, Exit Guide Vane - S	245590-100	10/24/96	10/24/96	0.05	100%	
11640.24	Appd Casting CPD / Dwg, EGV Ring - S	245591	9/18/97	9/18/97	0.05	100%	Late - Need 7-31-97 (Past Due)
11640.25	Need Casting Dwg, EGV Ring - S	245591	7/31/97	7/31/97	0	100%	
11640.26	Appd CPD / Dwg, EGV Vane - S (Agilis)	245590	1/26/98	1/26/98	0.05	100%	Late - Need 7-31-97 (Past Due)
11640.27	Need Dwg, EGV Vane - S	245590	7/31/97	7/31/97	0	100%	
11640.28	Appd CPD 4 / Dwg, Exit Guide Vane Assy - S	245590	4/1/98	4/1/98	0.05	0%	
11640.29	Need Dwg, Exit Guide Vane Assy - S	245590	10/15/97	10/15/97	0	100%	
11640.30	Complete Assy, Exit Guide Vane Assy - S	245590-100	5/15/98	5/15/98	0.10	0%	
11640.31	Need Assy, Exit Guide Vane Assy - S	245590-100	5/15/98	5/15/98	0	0%	
11800	**Exhaust Section - S**		**2/15/96**	**6/15/98**	**0**	**60%**	
11810	Exhaust Diffuser / Bng Assy - S		2/15/96	6/15/98	0	60%	
11820	Exhaust Assy - S	245825-100	11/20/96	6/15/98	0	60%	
11820.1	Start DLA, Exhaust Assy - S	245825-100	1/27/97	1/27/97	0.10	100%	
11820.2	Appd CPD / Dwg, Exhaust Collector Assy - S	245826	2/9/98	2/9/98	0.20	100%	Late - Need 7-17-97 (Past Due)



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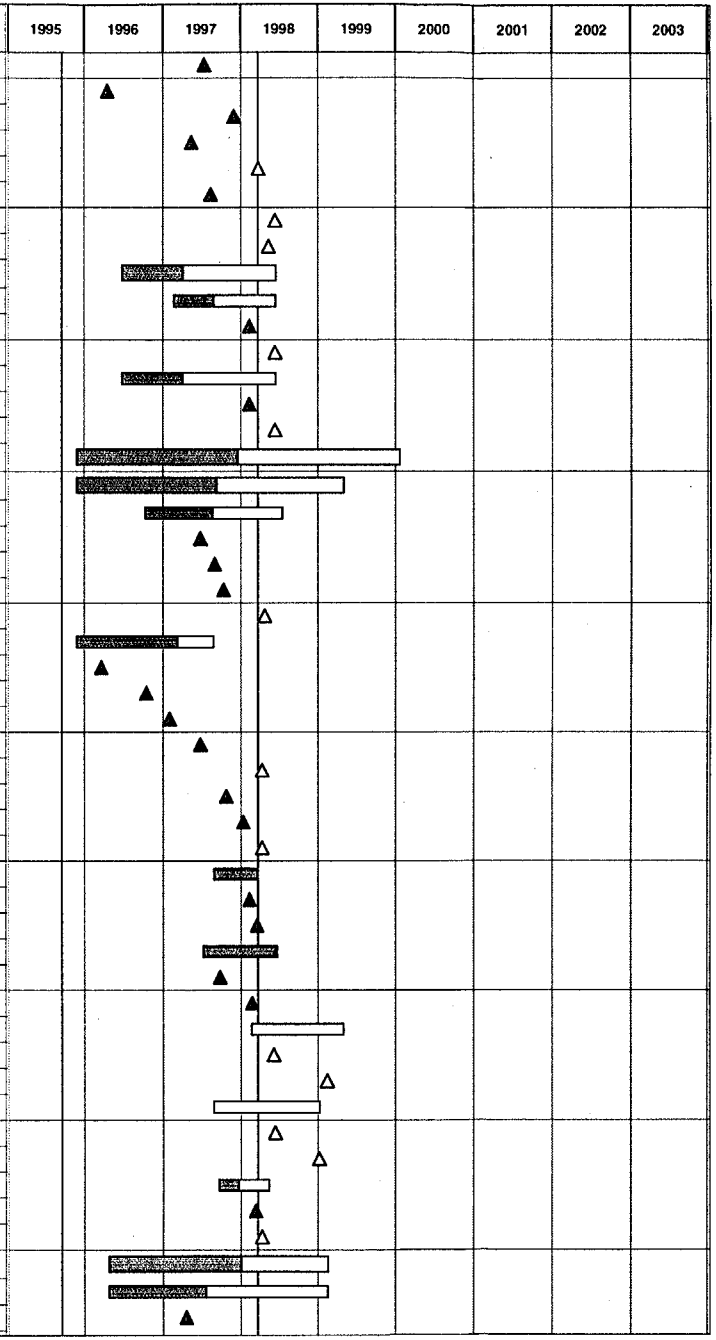
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
11820.3	Need Dwg, Exhaust Collector Assy - S	245826	7/17/97	7/17/97	0	100%	
11820.4	Start DLA, Center Frame - S	245830-100	4/15/96	4/15/96	0.10	100%	
11820.5	Appd CPD / Dwg, Center Frame - S	245830	12/1/97	12/1/97	0.20	100%	Late - Need 5-18-97 (Past Due)
11820.6	Need Dwg, Center Frame - S	245830	5/18/97	5/18/97	0	100%	Past Due
11820.7	Appd CPD / Dwg, Exhaust Assy - S	245825	4/1/98	4/1/98	0.20	0%	Late - Need 8-17-97 (Past Due)
11820.8	Need Dwg, Exhaust Assy - S	245825	8/17/97	8/17/97	0	100%	
11820.9	Complete Assy, Exhaust Assy - S	245825-100	6/15/98	6/15/98	0.20	0%	Late - Need 5-15-98
11820.10	Need Assy, Exhaust Assy - S	245825-100	5/15/98	5/15/98	0	0%	
11900	**Engine Common Parts - S**		**7/1/96**	**6/15/98**	**0**	**40%**	
11910	**Bleed Valve & Duct Assy - S**		**2/28/97**	**6/15/98**	**0**	**40%**	
11910.1	Release Final Design, Relief Valve & Duct Assy - S		2/15/98	2/15/98	0.40	100%	
11910.2	Complete Fab, Relief Valve & Duct Assy - S		6/15/98	6/15/98	0.60	0%	
11920	**Engine Assembly Hardware -S**		**7/1/96**	**6/15/98**	**0**	**40%**	
11920.1	Release Design, Engine Assy Hardware - S		2/15/98	2/15/98	0.40	100%	
11920.2	Complete Fab, Engine Assy Hardware - S		6/15/98	6/15/98	0.60	0%	
12000	**Package Systems - S**		**12/1/95**	**1/17/00**	**0**	**50%**	
12100	**Package Mechanical Systems - S**		**12/1/95**	**4/30/99**	**0**	**53%**	
12110	**Generator - S**		**10/18/96**	**7/14/98**	**0**	**50%**	
12110.1	Release, Generator Spec.- S		7/1/97	7/1/97	0.10	100%	
12110.2	Release, Generator Procurement Drawing - S		9/1/97	9/1/97	0.20	100%	
12110.3	Review, Supplier Generator Documentation - S		10/15/97	10/15/97	0.20	100%	
12110.4	Procure, Generator (Test Cell) - S		4/30/98	4/30/98	0.50	0%	
12120	**Reduction Gearbox - S**		**12/1/95**	**8/29/97**	**0**	**75%**	
12120.1	Release, Reduction Gearbox Spec. - S		3/15/96	3/15/96	0.20	100%	
12120.2	Complete Supplier Proposals, Gearbox - S		10/16/96	10/16/96	0.10	100%	
12120.3	Release P.O., Reduction Gearbox - S		2/5/97	2/5/97	0.10	100%	
12120.4	PDR Complete, Dev. Reduction Gearbox - S		7/1/97	7/1/97	0.10	100%	
12120.4a	PDR Complete, Production Reduction Gearbox - S		4/15/98	4/15/98	0.10	0%	
12120.5	Complete Fab, Dev. Reduction Gearbox - S		10/31/97	10/31/97	0.10	100%	
12120.6	Complete Test, Dev. Reduction Gearbox - S		1/15/98	1/15/98	0.15	100%	
12120.7	Receive, Reduction Gearbox - S		4/15/98	4/15/98	0.15	0%	
12130	**Electrical Conduit / J-Boxes - S**		**9/2/97**	**3/25/98**	**0**	**100%**	
12130.1	Release, Electrical Conduit / J-boxes - S		2/15/98	2/15/98	0.40	100%	
12130.2	Procure Electrical System Components - S		3/25/98	3/25/98	0.60	100%	
12140	**Package / Generator Frame - S**		**7/18/97**	**6/22/98**	**0**	**100%**	
12140.1	Release, Final Design, Package Frame - S		9/30/97	9/30/97	0.40	100%	
12140.2	Complete Fab, Package Frame - S		2/28/98	2/28/98	0.60	100%	
12150	**Enclosure Assembly - S**		**3/2/98**	**4/30/99**	**0**	**0%**	
12150.1	Release Final Design, Package Enclosure - S		6/12/98	6/12/98	0.40	0%	
12150.2	Procure, Package Enclosure - S		2/15/99	2/15/99	0.60	0%	
12160	**Inlet Filter / Silencer / Ducting - S**		**9/2/97**	**1/12/99**	**0**	**1%**	
12160.1	Release Design, Inlet Filter - S		6/15/98	6/15/98	0.40	0%	
12160.2	Procure / Fab, Inlet Filter - S		1/12/99	1/12/99	0.60	0%	
12170	**Recuperator Support - S**		**10/1/97**	**5/18/98**	**0**	**40%**	
12170.1	Release Design, Recuperator Support - S		3/15/98	3/15/98	0.40	100%	
12170.2	Procure Fab. Recuperator Support - S		4/15/98	4/15/98	0.60	0%	
12200	**Package Control & Indicating System - S**		**5/1/96**	**2/14/99**	**0**	**61%**	
12210	**Control Console - S**		**5/1/96**	**2/12/99**	**0**	**45%**	
12210.1	Release, Controls Spec. - S		4/21/97	4/21/97	0.10	100%	



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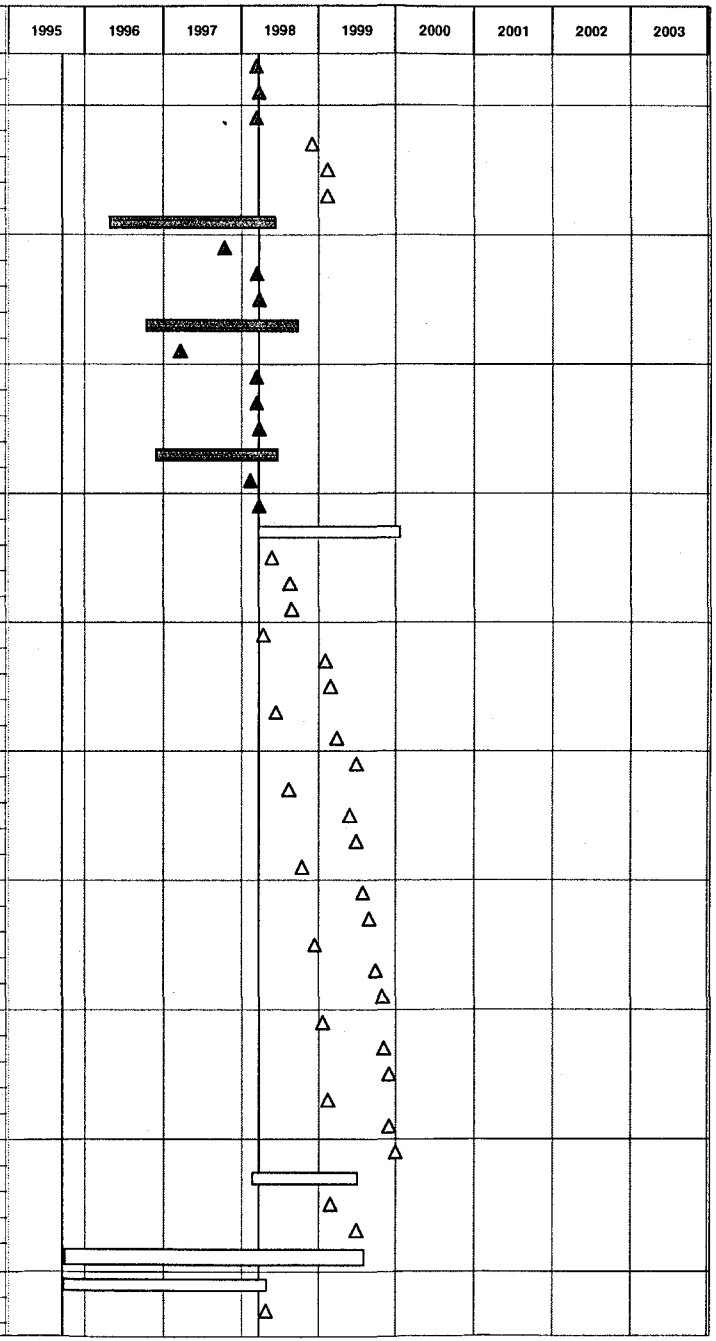
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
12210.2	Complete Design, On Skid Controller Prototype - S		3/15/98	3/15/98	0.10	100%	
12210.3	Complete Test, In-House OSC - S		3/31/98	3/31/98	0.15	100%	
12210.4	Release, Control Schematic / Wiring Drawing - S		3/15/98	3/15/98	0.10	100%	
12210.5	Assemble, Control Console - S		12/5/98	12/5/98	0.15	0%	
12210.6	Complete, Control Console Static Test - S		2/14/99	2/14/99	0.25	0%	
12210.7	Complete Design, On Skid Controller - S		2/14/99	2/14/99	0.15	0%	
12220	**Lube Oil System - S**		**5/1/96**	**6/8/98**	**0**	**100%**	
12220.1	Release, Lube Oil System Schematic - S		10/15/97	10/15/97	0.25	100%	
12220.2	Release, Lube Oil Piping - S		3/15/98	3/15/98	0.25	100%	
12220.3	Procure, Lube Oil System Components - S		3/31/98	3/31/98	0.50	100%	
12230	**Package Fuel System - S**		**10/18/96**	**9/23/98**	**0**	**100%**	
12230.1	Release, Fuel System Schematic - S		3/25/97	3/25/97	0.15	100%	
12230.2	Procure, Fuel System Componets - S		3/15/98	3/15/98	0.25	100%	
12230.3	Release, Fuel Piping - S		3/15/98	3/15/98	0.25	100%	
12230.4	Complete Fab, Lube & Fuel Piping - S		3/31/98	3/31/98	0.35	100%	
12240	**Start System - S**		**12/1/96**	**6/22/98**	**0**	**100%**	
12240.1	Release Design, Start System - S		2/15/98	2/15/98	0.40	100%	
12240.2	Procure, Start System Components - S		3/31/98	3/31/98	0.60	100%	
12300	**Package Build - S**		**3/31/98**	**1/17/00**	**0**	**0%**	
12300.1	Critical Design Review (CDR) - S		5/29/98	5/29/98	0.04	0%	
12300.2	Develop, Package Build Book S		8/21/98	8/21/98	0.02	0%	
12300.3	Review, Preproduction Design - S		8/28/98	8/28/98	0.03	0%	
12300.4	ACS, Package / Engine # 3 (Patio) - S		4/15/98	4/15/98	0.03	0%	
12300.5	Package Cash, Package / Engine # 3 (Patio) - S		2/1/99	2/1/99	0.04	0%	
12300.6	Ship, Package / Engine # 3 (Patio) - S		2/28/99	2/28/99	0.06	0%	
12300.7	ACS, Package / Engine # 4 (Rochelle) - S		6/16/98	6/16/98	0.03	0%	
12300.8	Package Cash, Package / Engine # 4 (Rochelle) - S		4/1/99	4/1/99	0.04	0%	
12300.9	Ship, Package / Engine # 4 (Rochelle) - S		6/30/99	6/30/99	0.06	0%	
12300.10	ACS, Package / Engine # 5 (W. Mine) - S		8/14/98	8/14/98	0.03	0%	
12300.11	Package Cash, Package / Engine # 5 (W Mine) - S		6/1/99	6/1/99	0.04	0%	
12300.12	Ship, Package / Engine # 5 (W. Mine) - S		6/30/99	6/30/99	0.06	0%	
12300.13	ACS, Package / Engine # 6 (Open CFE) - S		10/16/98	10/16/98	0.03	0%	
12300.14	Package Cash, Package / Engine # 6 (Open CFE) - S		8/1/99	8/1/99	0.04	0%	
12300.15	Ship, Package / Engine # 6 (CFE) - S		8/31/99	8/31/99	0.06	0%	
12300.16	ACS, Package / Engine # 7 (CFE) - S		12/18/98	12/18/98	0.03	0%	
12300.17	Package Cash, Package / Engine # 7 (CFE) - S		10/1/99	10/1/99	0.04	0%	
12300.18	Ship, Package / Engine # 7 (CFE) - S		10/31/99	10/31/99	0.06	0%	
12300.19	ACS, Package / Engine # 2 (DOE) - S		1/21/99	1/21/99	0.03	0%	
12300.20	Package Cash, Package / Engine # 2 (DOE) - S		11/1/99	11/1/99	0.04	0%	
12300.21	Ship, Package / Engine # 2 (DOE) - S		11/30/99	11/30/99	0.06	0%	
12300.22	ACS, Package / Engine # 8 (CFE) - S		2/17/99	2/17/99	0.03	0%	
12300.23	Package Cash, Package / Engine # 8 (CFE) - S		12/1/99	12/1/99	0.04	0%	
12300.24	Ship, Package / Engine # 8 (CFE) - S		12/31/99	12/31/99	0.06	0%	
12400	**O & M Manual / Illustrated Parts List - S**		**3/2/98**	**6/30/99**	**0**	**1%**	
12400.1	First Draft, O & M Manual - S		2/28/99	2/28/99	0.40	0%	
12400.2	Publish O & M Manual - S		6/30/99	6/30/99	0.60	0%	
17000	**Balance Of Plant - S**		**9/14/95**	**7/28/99**	**0**	**1%**	
17100	Reference Plant Standardization		9/14/95	5/1/98	0	1%	
17100.1	Complete, Reference Plant Standardization		5/1/98	5/1/98	1.00	0%	



Advanced Turbine Systems
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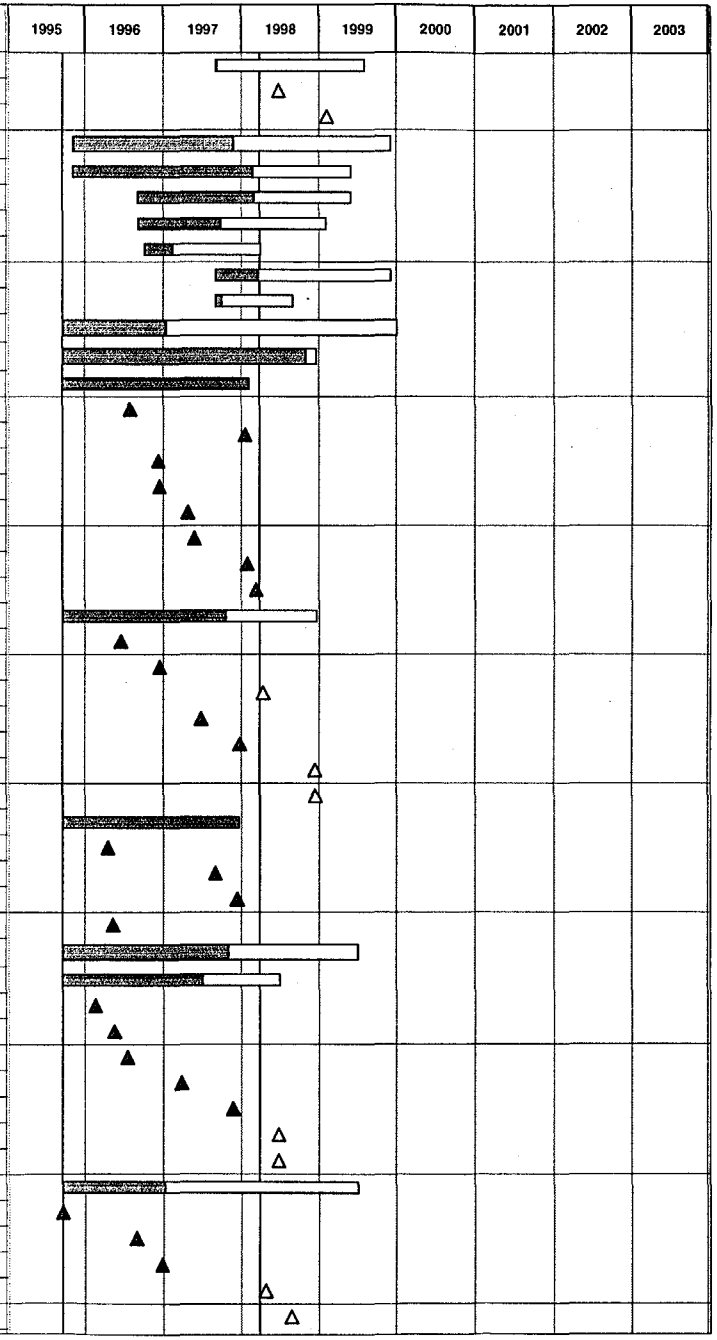
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
17200	Balance of Plant - S		9/2/97	7/28/99	0	1%	
17200.1	Release, Balance of Plant Design - S		6/30/98	6/30/98	0.40	0%	
17200.2	Procure, Balance of Plant - S		2/8/99	2/8/99	0.60	0%	
18000	**Tooling / Fixtures - S**		**11/3/95**	**12/1/99**	**0**	**51%**	
18100	Cold Section Tooling - S		11/3/95	5/28/99	0	65%	
18200	Hot Section Tooling - S		9/3/96	5/28/99	0	55%	
18300	Rotors Tooling - S		9/3/96	1/29/99	0	45%	
18400	Recuperator Tooling - S		10/1/96	3/31/98	0	25%	
18500	Engine Assy Tooling - S		9/2/97	12/1/99	0	25%	
18700	Superior Gear Tooling - S		9/2/97	8/31/98	0	10%	
19000	**Technology Development**		**9/14/95**	**12/30/9**	**0**	**31%**	
19100	**Advanced Cooling & Sealing**		**9/14/95**	**12/15/9**	**0**	**97%**	
19110	Advanced Rotor Sealing (ARS)		9/14/95	2/2/98	0	100%	
19110.1	Complete, Fir Tree Attachment Cooling Definition - AR		7/26/96	7/26/96	0.15	100%	Design Info to Design
19110.2	Complete, Rim Seal Flow Optimization Definition - AR		1/20/98	1/20/98	0.15	100%	D/45 Priority & Test Egr Req'd
19110.3	Complete Rotor Def, Impingment Cooling Optimizatio		12/10/96	12/10/96	0.10	100%	
19110.4	Complete Build, Test Rig - ARS		12/17/96	12/17/96	0.15	100%	
19110.5	Rim Seal Design Info to Mech. Design - ARS		5/1/97	5/1/97	0.15	100%	Rim Seal Design Info to Design
19110.6	Complete Build, Test Rig - ARS		6/1/97	6/1/97	0.10	100%	
19110.7	Complete, Test Report Cooling Technologies - ARS		1/31/98	1/31/98	0.10	100%	
19110.8	Complete, Topical Report, Adv Cooling & Sealing - S&		3/15/98	3/15/98	0.10	100%	
19120	Advanced Airfoil Cooling - AAC		9/14/95	12/15/98	0	65%	
19120.1	Complete, Screw Cooling Development - AAC		6/14/96	6/14/96	0.25	100%	
19120.2	Complete, Blade Vortex Cooling Test Rig - AAC		12/13/96	12/13/96	0.25	100%	
19120.3	Complete Topical Report, Screw Cooling - ACC		4/15/98	4/15/98	0.10	0%	
19120.4	Complete Test Rig, Film Cooling - AAC		6/30/97	6/30/97	0.05	100%	
19120.5	Complete Topical Report, Film Cooling - ACC		12/31/97	12/31/97	0.10	100%	
19120.6	Complete, Cooling Flow Optimization - ACC		12/15/98	12/15/98	0.15	0%	
19120.7	Complete Topical Report, Cooling Flows - ACC		12/15/98	12/15/98	0.10	0%	
19130	Tip Clearance Control - TCC		9/14/95	12/15/97	0	100%	
19130.1	Complete, Saturn Concept Selection - TCC		4/15/96	4/15/96	0.20	100%	
19130.2	Complete Build, Saturn Engine - TCC		9/1/97	9/1/97	0.30	100%	Slipped due to Test Bed Availability
19130.3	Complete, Saturn Test Report - TCC		12/15/97	12/15/97	0.30	100%	
19130.4	Complete, Mars Concept Selection - TCC		5/10/96	5/10/96	0.20	100%	
19200	**Low Emission Combustion**		**9/14/95**	**6/30/99**	**0**	**57%**	
19210	Ultra Lean Premix (ULP)		9/14/95	6/30/98	0	65%	
19210.1	Release Prelim. Design, Injector Assy. - ULP		2/16/96	2/16/96	0.10	100%	
19210.2	Start Test, Injector Assy. Single Can - ULP		5/15/96	5/15/96	0.15	100%	
19210.3	Complete Selection, Injector Concept - ULP		7/15/96	7/15/96	0.15	100%	
19210.4	Complete Redesign, Injector Assy - ULP		4/1/97	4/1/97	0.10	100%	Completed without redesign
19210.5	Complete Test, Single Injector - ULP		11/30/97	11/30/97	0.15	100%	
19210.6	Complete Test, Combustor Liner - ULP		6/30/98	6/30/98	0.15	0%	
19210.7	Complete Topical Report, ULP Proof of Concept - ULP		6/30/98	6/30/98	0.20	0%	
19220	Catalytic Combustion (CAT)		9/14/95	6/30/99	0	35%	
19220.1	Start Design, Single Can Catalytic Combustor Rig - C		9/14/95	9/14/95	0.10	100%	
19220.2	Start Tests, Single Can Catalytic Combustion Rig - CA		8/30/96	8/30/96	0.10	100%	
19220.3	Complete Tests, Single Can Catalytic Combustion Rig		12/31/96	12/31/96	0.15	100%	
19220.4	Complete Design, Catalytic Combustor - CAT		4/30/98	4/30/98	0.15	0%	
19220.5	Complete Engine Assy, Catalytic Combustor - CAT		8/30/98	8/30/98	0.15	0%	



Advanced Turbine Systems
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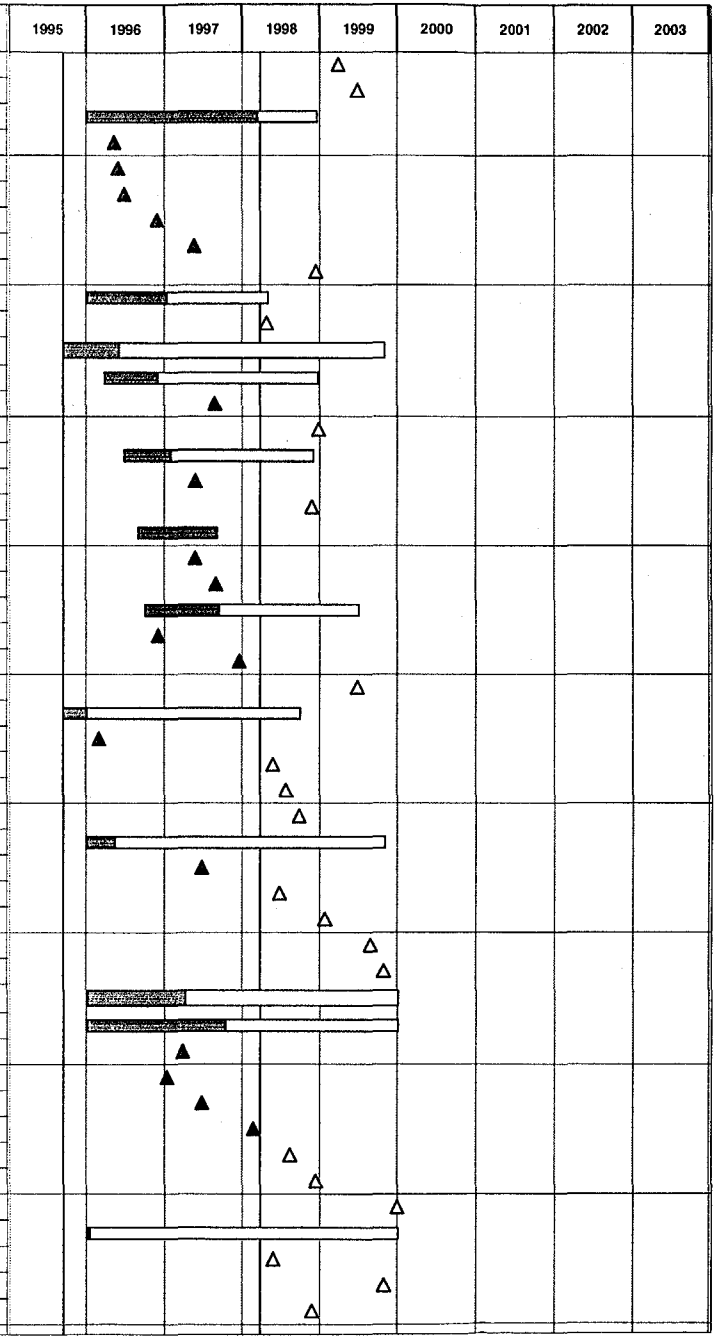
19220.6	Complete Tests, Catalytic Combustor - CAT		3/30/99	3/30/99	0.15	0%	
19220.7	Complete Topical Report, Low Emission Combustion		6/30/99	6/30/99	0.20	0%	
19230	**Advanced Combustion Controls**		**1/2/96**	**12/15/98**	**0**	**75%**	
19230.1	Complete, Injector Seal Test - Var Geometry		5/13/96	5/13/96	0.15	100%	
19230.2	Complete, System Definition - CO Sensor		5/30/96	5/30/96	0.10	100%	
19230.3	Complete, Loop Test - Var Geometry		6/30/96	6/30/96	0.10	100%	
19230.4	Complete, Variable Geometry Controls		11/30/96	11/30/96	0.15	100%	
19230.5	Complete, Loop Test - CO Sensor		5/23/97	5/23/97	0.25	100%	Slipped due to Test Bed Availability
19230.6	Complete, CO Sensor Controls		12/15/98	12/15/98	0.25	0%	
19240	**Advanced Liner Cooling (ALC)**		**1/2/96**	**5/1/98**	**0**	**45%**	
19240.1	Complete Topical Report, Low Emission Combustion		5/1/98	5/1/98	1.00	0%	
19300	**Ceramic & Composite Materials Dev.**		**9/14/95**	**10/29/9**	**0**	**18%**	
19310	**Ceramic Combustor Materials Dev.**		**4/1/96**	**12/23/98**	**0**	**25%**	
19310.1	Fab, Prototype Rings - Combustor		8/31/97	8/31/97	0.25	100%	
19310.2	Complete, Combustor Materials Dev.		12/30/98	12/30/98	0.75	0%	
19320	**Ceramic Tip Shoe Evaluation**		**7/1/96**	**11/30/98**	**0**	**25%**	
19320.1	Complete Procurement, Ceramic Tip Shoes		5/30/97	5/30/97	0.25	100%	
19320.2	Complete, Ceramic Tip Shoe Evaluation		11/30/98	11/30/98	0.75	0%	
19330	**Ceramic Bushing / Ball Bearing**		**9/1/96**	**9/1/97**	**0**	**100%**	
19330.1	Complete Procurement, Ball / Ball Bearing		5/30/97	5/30/97	0.25	100%	
19330.2	Complete, Ceramic Bushing / Ball Bearing		9/1/97	9/1/97	0.75	100%	
19340	**Ceramic Interstage Ring Seal Dev.**		**10/1/96**	**6/30/99**	**0**	**35%**	
19340.1	Complete Selection, Ring Seal Material		12/2/96	12/2/96	0.10	100%	
19340.2	Complete Rub Testing - Ring Seal		12/21/97	12/21/97	0.25	100%	
19340.3	Complete Ceramic Interstage Ring Seal Dev.		6/30/99	6/30/99	0.65	0%	
19350	**Ceramic Blade Dev.**		**9/14/95**	**9/30/98**	**0**	**10%**	
19350.1	Complete Material Selection, Ceramic Blade Dev.		2/29/96	2/29/96	0.10	100%	
19350.2	Complete, Attachment Test - Blade		5/31/98	5/31/98	0.25	0%	
19350.3	Complete, Proof Test - Blade		7/30/98	7/30/98	0.25	0%	
19350.4	Complete, Ceramic Blade Dev.		9/30/98	9/30/98	0.40	0%	
19360	**Ceramic Nozzle Dev.**		**1/2/96**	**10/29/99**	**0**	**10%**	
19360.1	Complete Material Selection, Ceramic Nozzle		6/27/97	6/27/97	0.10	100%	
19360.2	Complete, Procure Speciment - Ceramic Nozzle		6/30/98	6/30/98	0.15	0%	
19360.3	Complete, Simulation Testing - Ceramic Nozzle		1/30/99	1/30/99	0.25	0%	
19360.4	Complete, Ceramic Nozzle Dev.		8/31/99	8/31/99	0.25	0%	
19360.5	Complete Topical Report, Ceramic & Composite Mate		10/29/99	10/29/99	0.25	0%	
19400	**Turbine Material Development**		**1/2/96**	**12/30/9**	**0**	**32%**	
19410	**Forged Disk Materials**		**1/2/96**	**12/30/99**	**0**	**45%**	
19410.1	Complete, Prototype Forged Disk		3/30/97	3/30/97	0.10	100%	Design Info to Design
19410.2	Deliver, Prelim Design Info to Design - Forged Disk		1/15/97	1/15/97	0.10	100%	
19410.3	Start, Mechanical Properties Tests - Forged Disk		6/30/97	6/30/97	0.10	100%	
19410.4	Complete, Scale Design - Forged Disk		2/28/98	2/28/98	0.15	100%	
19410.5	Complete, Life Predictions - Forged Disk		8/15/98	8/15/98	0.15	0%	
19410.6	Complete, Engine Test - Forged Disk		12/15/98	12/15/98	0.25	0%	
19410.7	Complete, Topical Report, Disk Materials Dev.		12/30/99	12/30/99	0.15	0%	
19420	**Dual Alloy Disks**		**1/2/96**	**12/30/99**	**0**	**1%**	
19420.1	Complete, Alloy Cost Evaluation - Dual Alloy Disks		6/1/98	6/1/98	0.15	0%	
19420.2	Complete, Engine Test - Dual Alloy Disk		10/30/99	10/30/99	0.25	0%	10/97 Design Info to Design
19420.3	Complete, Mechanical Properties - Dual Alloy Disk		11/30/98	11/30/98	0.35	0%	



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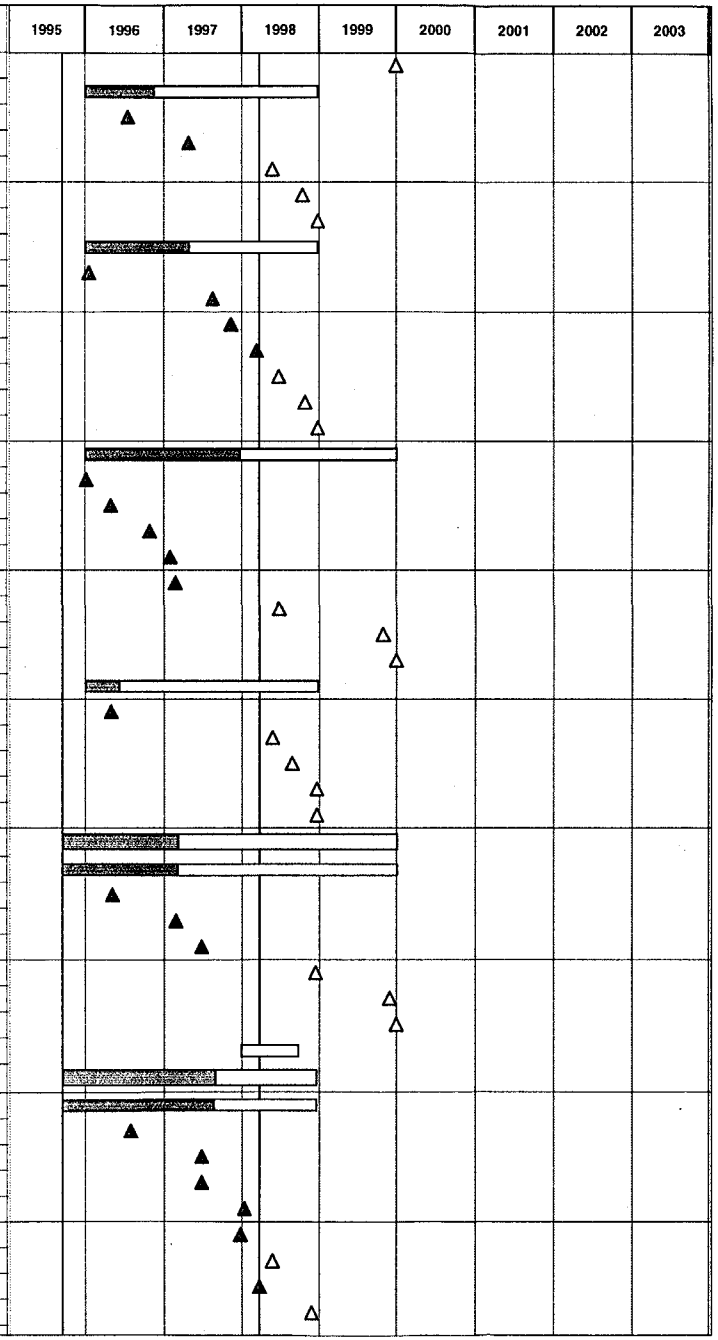
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
19420.4	Complete, Topical Report - Dual Alloy Disk Material D		12/30/99	12/30/99	0.25	0%	
19430	**CMSX-10 Material Dev.**		**1/2/96**	**12/23/98**	**0**	**30%**	
19430.1	Complete, Casting Trials - CMSX-10		7/15/96	7/15/96	0.15	100%	
19430.2	Complete, Coating Evaluation - CMSX-10		4/30/97	4/30/97	0.15	100%	
19430.3	Complete, Mechanical Properties - CSMX-10		5/30/98	5/30/98	0.15	0%	
19430.4	Complete, Engine Test - CSMX-10		10/15/98	10/15/98	0.25	0%	
19430.5	Complete, Topical Report - CMSX-10 Material Dev.		12/30/98	12/30/98	0.25	0%	
19440	**Low CTE Materials**		**1/2/96**	**12/23/98**	**0**	**45%**	
19440.1	Complete, Forging Dev. - CTE		1/15/96	1/15/96	0.15	100%	
19440.2	Complete, Prototype Demo (12") - CTE		8/25/97	8/25/97	0.05	100%	Changed to engine specific materials.
19440.3	Complete, Heat Treat Optiimization - CTE		11/15/97	11/15/97	0.15	100%	12/96 Design Info to Design
19440.4	Complete, Prototype Demo (10") - CTE		3/15/98	3/15/98	0.10	100%	Changed to engine specific materials.
19440.5	Complete, Mechanical Properties - CTE		6/30/98	6/30/98	0.15	0%	
19440.6	Complete, Engine Test - CTE		10/30/98	10/30/98	0.25	0%	
19440.7	Complete, Topical Report - Low CTE Materials Develo		12/30/98	12/30/98	0.15	0%	
19450	**Advanced Casting Techniques (AdCst)**		**1/2/96**	**12/30/99**	**0**	**50%**	
19450.1	Complete, PMC Alloy Selection - AdCst		1/5/96	1/5/96	0.10	100%	
19450.2	Complete, Spraycast Alloy Selection - AdCst		5/1/96	5/1/96	0.10	100%	
19450.3	Complete, Perm Mold Casting Process - AdCst		10/31/96	10/31/96	0.15	100%	11/96 Design Info to Design
19450.4	Complete, Optimize Spray Cast Process - AdCst		1/31/97	1/31/97	0.05	100%	
19450.4a	Complete, Optimization HT / HIP for Haynes 242 - Ad		3/1/97	3/1/97	0.10	100%	
19450.5	Complete, Mechanical Properties - AdCst		6/30/98	6/30/98	0.15	0%	2/97 Spraycast Design Info to Design
19450.6	Complete, Engine Test - AdCst		10/30/99	10/30/99	0.20	0%	
19450.7	Complete, Topical Report - Adv. Casting Techniques		12/30/99	12/30/99	0.15	0%	
19460	**NDE / Life Prediction (NDE)**		**1/2/96**	**12/23/98**	**0**	**15%**	
19460.1	Complete, Program Plans - NDE		4/30/96	4/30/96	0.15	100%	
19460.2	Complete, Technique Demos - NDE		6/1/98	6/1/98	0.20	0%	Replanned one year out on 6-1-97
19460.3	Complete, Dev. Inspection Techniques - NDE		8/31/98	8/31/98	0.25	0%	
19460.4	Complete, Analyze Components - NDE		12/24/98	12/24/98	0.15	0%	
19460.5	Complete, NDE Life Predictions		12/24/98	12/24/98	0.25	0%	
19500	**Recuperator Material Development**		**9/14/95**	**12/30/9**	**0**	**35%**	
19500	**Recuperator Material Development**		9/14/95	12/30/99	0	35%	
19500.1	Complete, Plan For Material Selection - Recup		5/3/96	5/3/96	0.10	100%	
19500.2	Complete, Fabrication Trials - Recup		3/1/97	3/1/97	0.15	100%	
19500.3	Complete, Cost Model - Recup		7/1/97	7/1/97	0.10	100%	
19500.4	Complete, Mechanical Properties - Recup		12/15/98	12/15/98	0.15	0%	
19500.5	Complete, Engine Test - Recup		11/30/99	11/30/99	0.25	0%	
19500.6	Complete, Topical Report, Recuperator Material Dev.		12/30/99	12/30/99	0.25	0%	
19600	**Variable Area Nozzle (VAN) (Effort on Hold)**		**1/1/98**	**9/23/98**	**0**	**0%**	**No Current Need for VAN**
19700	**Advanced Coating Systems**		**9/14/95**	**12/17/9**	**0**	**61%**	
19710	**Thermal Barrier Coatings (TBC)**		9/14/95	12/17/98	0	60%	
19710.1	Complete, System Evaluation - TBC		7/31/96	7/31/96	0.10	100%	8/96 Design Info to Design
19710.2	Complete, Screening Tests - TBC		6/30/97	6/30/97	0.10	100%	7/97 Design Info to Design
19710.3	Complete, Mars Field Test - TBC		6/30/97	6/30/97	0.10	100%	Design Info to Design
19710.4	Complete, ATS Component Evaluation - TBC		1/15/98	1/15/98	0.10	100%	
19710.5	Complete, Life Pridictions - TBC		12/31/97	12/31/97	0.10	100%	
19710.6	Complete, ATS Component Coatings - TBC		5/31/98	5/31/98	0.10	0%	
19710.7	Complete Assy, Engine Hardware - TBC		3/31/98	3/31/98	0.10	100%	
19710.8	Complete Test, Engine Hardware - TBC		11/30/98	11/30/98	0.15	0%	



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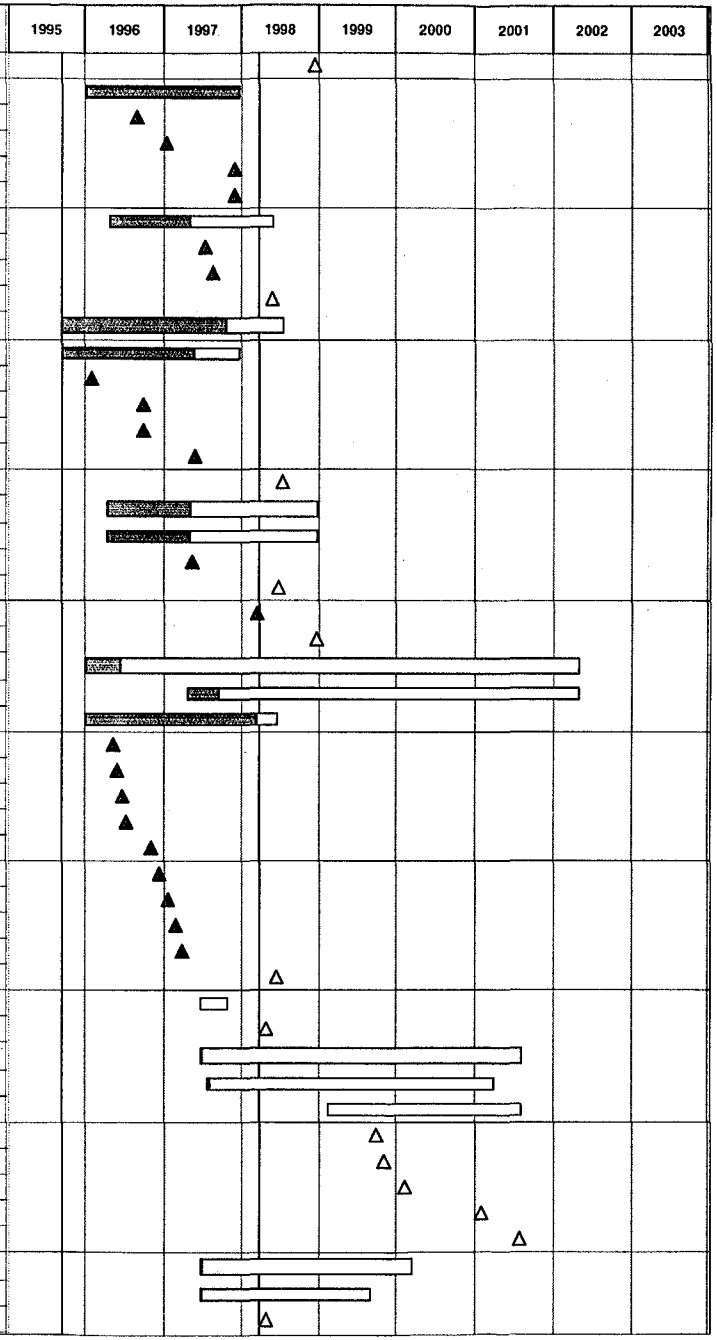
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
19710.9	Complete Topical Report, Adv Coating Systems Dev.		12/17/98	12/17/98	0.15	0%	
19720	Chemcial Vapor Deposition (CVD)		1/2/96	12/23/97	0	100%	
19720.1	Complete, Sample Coatings - CVD		8/30/96	8/30/96	0.25	100%	
19720.2	Complete, Process Assessment - CVD		1/15/97	1/15/97	0.15	100%	
19720.2	Complete, Optimize Process - CVD		12/1/97	12/1/97	0.20	100%	Prioritization
19720.3	Complete, Chemical Vapor Deposition Tests - CVD		12/1/97	12/1/97	0.40	100%	
19730	Alloy Coating Systems (Coat)		5/1/96	5/29/98	0	50%	
19730.1	Complete, External Coatability - Coat		7/15/97	7/15/97	0.25	100%	
19730.2	Complete, Internal Coatability - Coat		8/20/97	8/20/97	0.25	100%	
19730.3	Complete, Alloy Coating Systems		5/31/98	5/31/98	0.50	0%	
19800	**Advanced Diffuser Development (ADD)**		**9/14/95**	**7/15/98**	**0**	**75%**	
19800	Advanced Diffuser Development (ADD)		9/14/95	12/23/97	0	75%	
19800.1	Complete, Design Annular Model - ADD		1/30/96	1/30/96	0.10	100%	
19800.2	Complete, Test Annular Model - ADD		9/30/96	9/30/96	0.20	100%	
19800.3	Start, Design Engine Diffuser - ADD		9/30/96	9/30/96	0.20	100%	
19800.4	Complete, Test Engine Diffuser - ADD		5/31/97	5/31/97	0.25	100%	Test deferred to S Engine due to test engine availability
19800.5	Complete, Topical Report, Advanced Diffuser		7/15/98	7/15/98	0.25	0%	
19900	**Advanced Man-Machine Interface (MMI)**		**4/15/96**	**12/24/9**	**0**	**40%**	
19900	Advanced Man-Machine Interface		4/15/96	12/23/98	0	40%	
19900.1	Complete, Analyze Data - MMI		5/16/97	5/16/97	0.15	100%	
19900.2	Complete, Test - MMI		7/1/98	7/1/98	0.20	0%	Phase 1 Verification Test
19900.3	Complete, Standardize - MMI		3/20/98	3/20/98	0.25	100%	
19900.4	Complete, Topical Report - MMI		12/24/98	12/24/98	0.40	0%	
20000	**Advanced Turbine System - L**		**1/2/96**	**5/1/02**	**0**	**7%**	
20100	Technical Coordination - L		5/1/97	5/1/02	0	8%	
20200	Engine Definition - L		1/2/96	6/15/98	0	90%	
20200.1	Complete 1st Draft, Marketing Reqmt Spec - L		5/10/96	5/10/96	0.10	100%	
20200.2	Complete, 1st Engine Cross-section Dwg - L		6/1/96	6/1/96	0.10	100%	
20200.3	Complete 1st Draft, Product Spec - L		6/25/96	6/25/96	0.10	100%	
20200.4	Complete 1st Draft, Business Plan Review - L		7/10/96	7/10/96	0.10	100%	
20200.5	Revised Market Reqmt Spec - L		11/1/96	11/1/96	0.10	100%	
20200.6	Complete Draft, Business Plan - L		12/10/96	12/10/96	0.05	100%	
20200.7	Present, Business Plan For PC Approval - L		1/21/97	1/21/97	0.10	100%	
20200.8	Finalize, Business Plan - L		2/28/97	2/28/97	0.15	100%	
20200.9	Approval, Business Plan - L		3/31/97	3/31/97	0.10	100%	
20200.10	Complete, Concept Design - L		6/15/98	6/15/98	0.10	0%	
20300	Package Definition - L		7/1/97	10/31/97	0	1%	
20300.1	Complete, System Design Review - L		4/30/98	4/30/98	1.00	0%	
21000	**Engine Assembly - L**		**6/30/97**	**8/1/01**	**0**	**1%**	
21010	Engine Design Support - L		7/31/97	3/30/01	0	1%	
21020	Engine Build - L		2/15/99	8/1/01	0	0%	
21010.1	Complete, Engine Assembly Drawings - L		9/29/99	9/29/99	0.25	0%	
21010.2	Cash, Engine #1 - L		11/1/99	11/1/99	0.40	0%	
21010.3	Cash, Engine #2 - L		2/11/00	2/11/00	0	0%	
21010.4	Complete Build, Engine #3 - L		1/31/01	1/31/01	0	0%	
21010.5	Complete Rebuild, DOE Demo Engine #1 - L		8/1/01	8/1/01	0.35	0%	
21100	**Air Inlet System - L**		**6/30/97**	**3/8/00**	**0**	**1%**	
21110	Inlet Collector - L		6/30/97	8/26/99	0	1%	
21110.1	Release Final Design, Inlet Air Assembly - L		5/1/98	5/1/98	0.40	0%	



Advanced Turbine Systems
Phase 3 and 4
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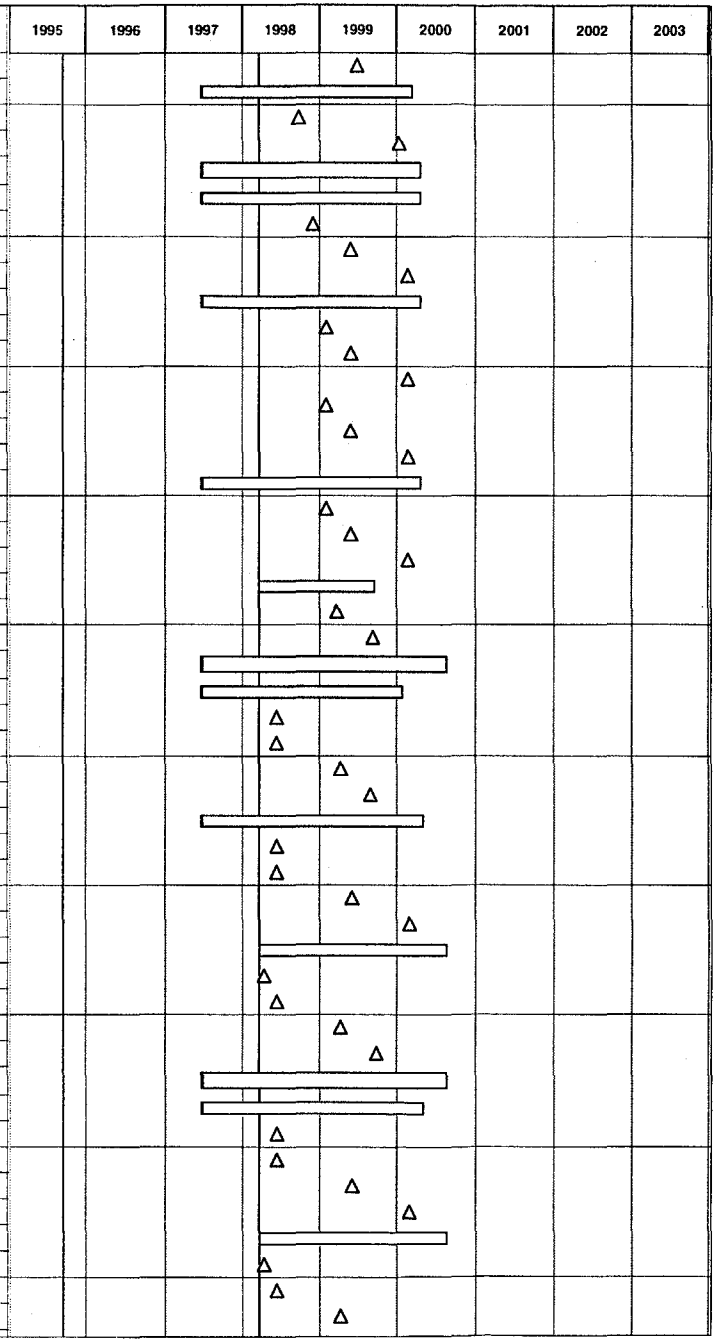
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
21110.2	Complete Fab, Inlet Air Assembly - L		6/29/99	6/29/99	0.60	0%	
21120	Inlet Air Assembly - L		6/30/97	3/8/00	0	1%	
21120.1	Release Final Design, Inlet Air Assembly - L		10/1/98	10/1/98	0.40	0%	
21120.2	Complete Fab, Inlet Air Assembly - L		1/11/00	1/11/00	0.60	0%	
21200	**Compressor Assembly - L**		**6/30/97**	**4/19/00**	**0**	**1%**	
21210	Compressor Rotor Assy - L		6/30/97	4/19/00	0	1%	
21210.1	Release Final Design, Compressor Rotor Assy - L		12/4/98	12/4/98	0.40	0%	
21210.1	Complete Procure, Compressor Rotor Assy - L		6/1/99	6/1/99	0	0%	
21210.2	Complete Fab, Compressor Rotor Assy - L		2/22/00	2/22/00	0.60	0%	
21220	Compressor Casing / Stator Assy - L		6/30/97	4/19/00	0	1%	
21220.1	Release Final Design, Compressor Casing Assy - L		2/1/99	2/1/99	0.20	0%	
21220.1	Complete Procure, Compressor Casing Assy - L		6/1/99	6/1/99	0.40	0%	
21220.2	Complete Fab, Compressor Casing Assy - L		2/22/00	2/22/00	0.40	0%	
21230.1	Release Final Design, Compressor Stator Assy - L		2/1/99	2/1/99	0	0%	
21230.1	Complete Procure, Compressor Stator Assy - L		6/1/99	6/1/99	0	0%	
21230.2	Complete Fab, Compresor Stator Assy - L		2/22/00	2/22/00	0	0%	
21240	Compressor Diffuser / Bearing Assy - L		6/30/97	4/19/00	0	1%	
21240.1	Release Design, Comp Diffuser/Bearing Assy - L		2/1/99	2/1/99	0.20	0%	
21240.1	Complete Procure, Comp Diffuser/Bearing Assy - L		6/1/99	6/1/99	0.40	0%	
21240.2	Complete Fab, Comp Diffuser/Bearing Assy - L		2/22/00	2/22/00	0.40	0%	
21250	Compressor Common Parts - L		3/31/98	9/17/99	0	0%	
21250.1	Release Compressor Common Parts - L		3/22/99	3/22/99	0.40	0%	
21250.2	Complete Compressor Common Parts - L		9/9/99	9/9/99	0.60	0%	
21300	**Combustor System - L**		**6/30/97**	**8/14/00**	**0**	**1%**	
21320	Combustor Casing Assy - L		6/30/97	1/24/00	0	1%	
21320.1	Release Preliminary Design, Combustor Casing - L		6/15/98	6/15/98	0.10	0%	
21320.2	Complete Fab, Combustor Casing - L RIG		6/15/98	6/15/98	0.15	0%	
21320.3	Release Final Design, Combusor Casing - L		4/9/99	4/9/99	0.25	0%	
21320.4	Complete Fab, Combustor Casing - L		9/1/99	9/1/99	0.50	0%	
21330	LPM Combustor Liner Assy - L		6/30/97	4/26/00	0	1%	
21330.1	Release Preliminary Design, Combustor Liner - L		6/15/98	6/15/98	0.10	0%	
21330.2	Complete Fab, Combustor Liner - L RIG		6/15/98	6/15/98	0.15	0%	
21330.3	Release Final Design, Combusor Liner - L		6/7/99	6/7/99	0.25	0%	
21330.4	Complete Fab, Combustor Liner - L		2/29/00	2/29/00	0.50	0%	
21340	Ignitor Torch Assy - L		3/31/98	8/14/00	0	0%	
21340.1	Release Preliminary Design, Ignitor Torch Assy - L		4/15/98	4/15/98	0.10	0%	
21340.2	Complete Fab, Ignitor Torch Assy - L RIG		6/15/98	6/15/98	0.15	0%	
21340.3	Release Final Design, Ignitor Torch Assy - L		4/9/99	4/9/99	0.25	0%	
21340.4	Complete Fab, Ignitor Torch Assy - L		9/29/99	9/29/99	0.50	0%	
21500	**Fuel System - L**		**6/30/97**	**8/14/00**	**0**	**1%**	
21510	Fuel Injectors, LPM Gas - L		6/30/97	4/26/00	0	1%	
21510.1	Release Preliminary Design, Fuel Injectors - L		6/15/98	6/15/98	0.10	0%	
21510.2	Complete Fab, Fuel Injectors - L RIG		6/15/98	6/15/98	0.15	0%	
21510.3	Release Final Design, Fuel Injectors - L		6/7/99	6/7/99	0.25	0%	
21510.4	Complete Fab, Fuel Injectors - L		2/29/00	2/29/00	0.50	0%	
21520	Fuel Manifolds / Tube Assy - L		3/31/98	8/14/00	0	0%	
21520.1	Release Prelim Design, Fuel Manifolds - L		4/15/98	4/15/98	0.10	0%	
21520.2	Complete Fab, Fuel Manifolds - L RIG		6/15/98	6/15/98	0.15	0%	
21520.3	Release Final Design, Fuel Manifolds - L		4/9/99	4/9/99	0.25	0%	



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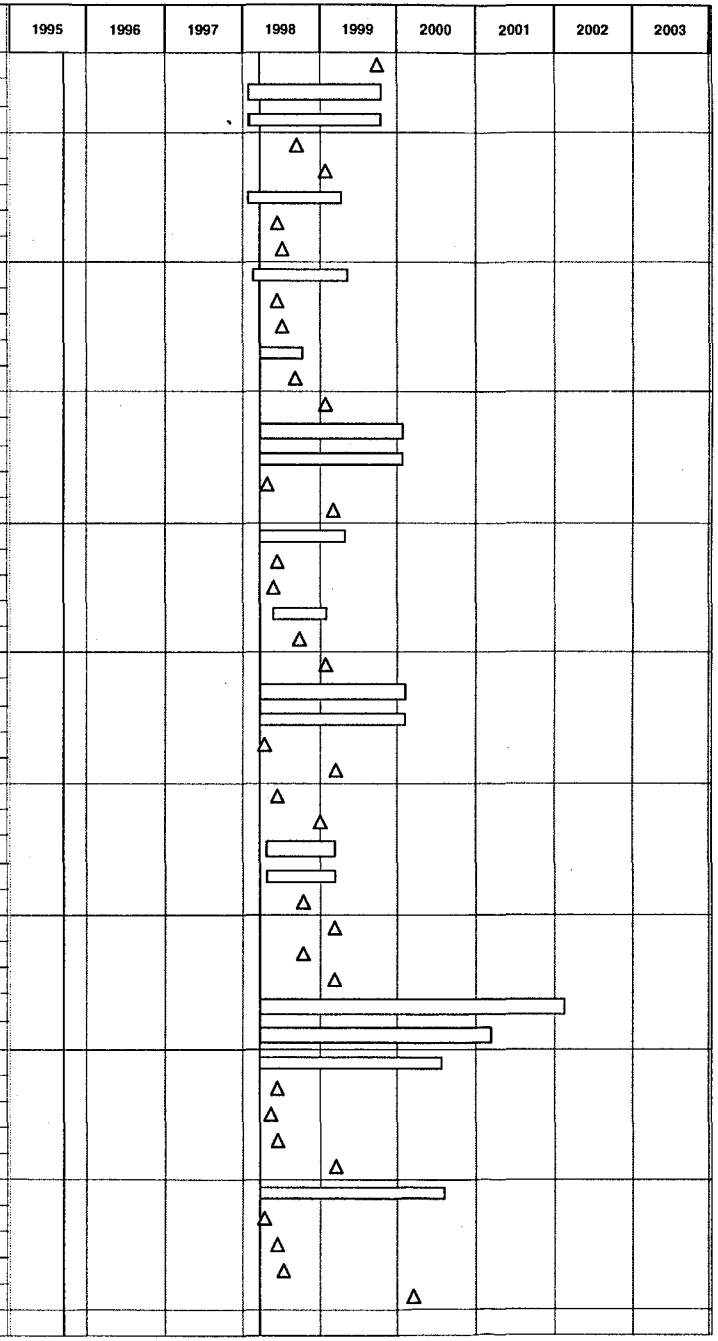
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
21520.4	Complete Fab, Fuel Manifolds - L		9/29/99	9/29/99	0.50	0%	
21600	**GP Turbine Section - L**		**2/1/98**	**10/12/9**	**0**	**1%**	
21610	GP Turbine Rotor Assy - L		2/1/98	10/12/99	0	1%	
21610.1	Release Final Design, GP Turbine Rotor Assy - L		9/15/98	9/15/98	0.40	0%	
21610.2	Complete Fab, GP Turbine Rotor Assy - L		1/25/99	1/25/99	0.60	0%	
21620	Turbine Casing Assy - L		2/1/98	4/12/99	0	1%	
21620.1	Release Final Design, Turbine Casing Assy - L		6/15/98	6/15/98	0.40	0%	
21620.2	Complete Fab, Turbine Casing Assy - L		7/14/98	7/14/98	0.60	0%	
21630	GP Turbine Nozzle Assy - L		3/2/98	5/10/99	0	0%	
21630.1	Release Final Design, GP Turbine Nozzle Assy - L		6/15/98	6/15/98	0.40	0%	
21630.2	Complete Fab, GP Turbine Nozzle Assy - L		7/14/98	7/14/98	0.60	0%	
21640	GP Common Parts - L		3/31/98	10/13/98	0	0%	
21640.1	Release, GP Common Parts - L		9/11/98	9/11/98	0.40	0%	
21640.2	Complete, GP Common Parts - L		1/25/99	1/25/99	0.60	0%	
21700	**Power Turbine Section - L**		**3/31/98**	**1/21/00**	**0**	**0%**	
21710	Power Turbine Rotor Assy - L		3/31/98	1/21/00	0	0%	
21710.1	Release Final Design, Power Turbine Rotor Assy - L		5/1/98	5/1/98	0.40	0%	
21710.2	Complete Fab, Power Turbine Rotor Assy - L		3/8/99	3/8/99	0.60	0%	
21720	PT Nozzle Assy - L		3/31/98	4/27/99	0	0%	
21720.1	Release Final Design, PT Nozzle Assy - L		6/15/98	6/15/98	0.40	0%	
21720.2	Complete Fab, PT Nozzle Assy - L		6/1/98	6/1/98	0.60	0%	
21730	PT Common Parts - L		6/1/98	1/25/99	0	0%	
21730.1	Release, PT Common Parts - L		9/30/98	9/30/98	0.40	0%	
21730.2	Complete, PT Common Parts - L		1/25/99	1/25/99	0.60	0%	
21800	**Exhaust Section - L**		**3/31/98**	**2/3/00**	**0**	**0%**	
21800	Exhaust Assy - L		3/31/98	2/3/00	0	0%	
21800.1	Release Final Design, Exhaust Diffuser / Bearing Assy		4/15/98	4/15/98	0.20	0%	
21800.2	Complete Fab, Exhaust Diffuser / Bearing Assy - L		3/20/99	3/20/99	0.30	0%	
21800.3	Release Final Design, Exhaust Collector Assy - L		6/15/98	6/15/98	0.20	0%	
21800.4	Complete Fab, Exhaust Collector Assy - L		1/5/99	1/5/99	0.30	0%	
21900	**Engine Common Parts - L**		**5/1/98**	**3/10/99**	**0**	**0%**	
21900	Engine Common Parts - L		5/1/98	3/10/99	0	0%	
21910.1	Release Final Design, Bleed Valve & Duct Assy - L		10/15/98	10/15/98	0.40	0%	
21910.2	Complete Fab, Bleed Valve & Duct Assy - L		3/10/99	3/10/99	0.60	0%	
21920.1	Release Design, Engine Assemly Hardware - L		10/15/98	10/15/98	0.40	0%	
21920.2	Complete Fab, Engine Assembly Hardware - L		3/10/99	3/10/99	0.60	0%	
22000	**Package Systems - L**		**3/31/98**	**2/14/02**	**0**	**0%**	
22100	**Package Mechanical Systems - L**		**3/31/98**	**3/9/01**	**0**	**0%**	
22110	Generator - L		3/31/98	7/25/00	0	0%	
22110.1	Release, Generator Spec. - L		6/15/98	6/15/98	0.10	0%	
22110.2	Release, Generator Procurement Drawing - L		5/15/98	5/15/98	0.15	0%	
22110.3	Review, Supplier Generator Documentation - L		6/15/98	6/15/98	0.25	0%	
22110.4	Procure, Generator - L		3/15/99	3/15/99	0.50	0%	
22120	Reduction Gearbox - L		3/31/98	8/1/00	0	0%	
22120.1	Release, Reduction Gearbox Spec. - L		4/15/98	4/15/98	0.10	0%	
22120.2	Release, Reduction Gearbox Procurement Drawing -		6/15/98	6/15/98	0.15	0%	
22120.3	Review, Gearbox Supplier Documentation - L		7/15/98	7/15/98	0.25	0%	
22120.4	Procure, Reduction Gearbox - L		3/15/00	3/15/00	0.50	0%	



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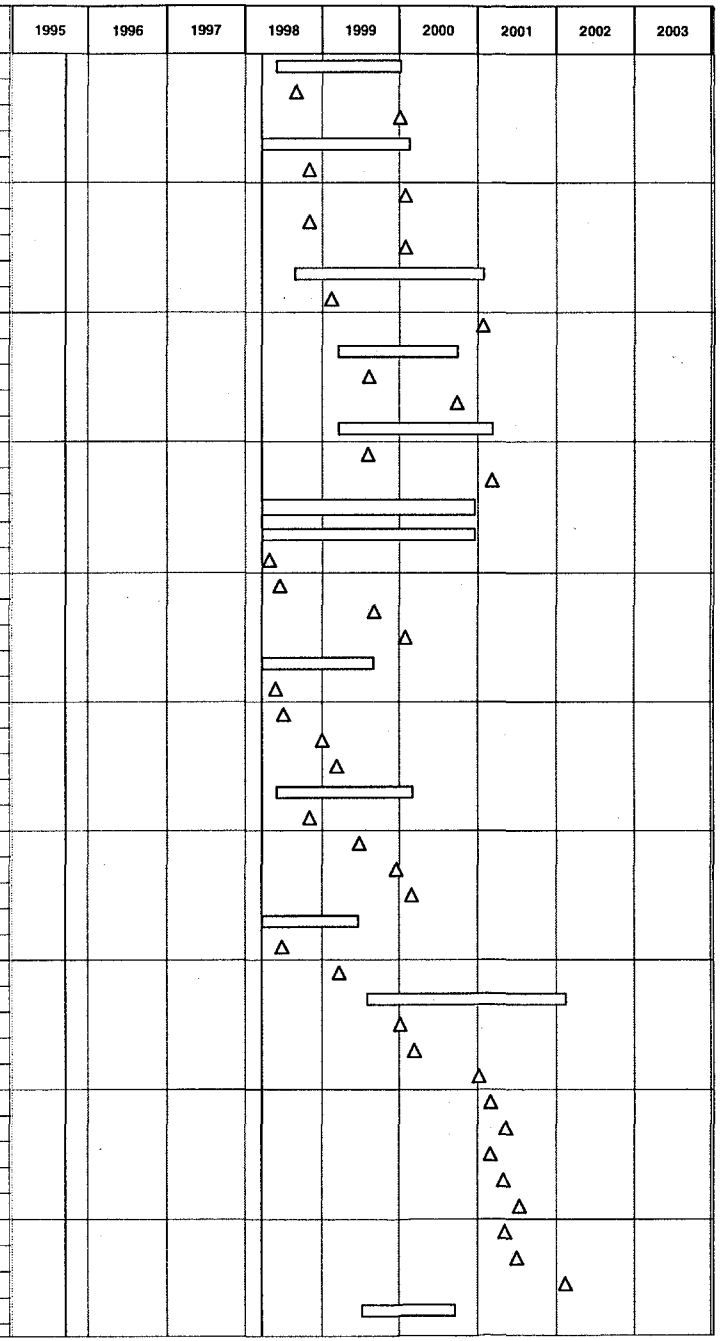
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
22130	**Electrical Conduit / J-Boxes - L**		6/3/98	1/4/00	0	0%	
22130.1	Release, Electrical Conduit /J-boxes - L		9/2/98	9/2/98	0.40	0%	
22130.2	Procure Electrical System Components - L		1/4/00	1/4/00	0.60	0%	
22140	**Package / Generator Frame - L**		3/31/98	2/17/00	0	0%	
22140.1	Release, Final Design, Package Frame - L		11/5/98	11/5/98	0.20	0%	
22140.2	Complete Fab. Package Frame - L		1/27/00	1/27/00	0.30	0%	
22140.3	Release, Final Design, Generator Frame - L		11/5/98	11/5/98	0.20	0%	
22140.4	Complete Fab. Generator Frame - L		1/27/00	1/27/00	0.30	0%	
22150	**Enclosure Assembly - L**		8/27/98	1/26/01	0	0%	
22150.1	Release Final Design, Enclosure Assembly - L		2/16/99	2/16/99	0.40	0%	
22150.2	Procure, Enclosure Assembly - L		1/26/01	1/26/01	0.60	0%	
22160	**Inlet Filter / Silencer / Ducting - L**		3/26/99	9/26/00	0	0%	
22160.1	Release, Final Design, Inlet Filter - L		8/9/99	8/9/99	0.40	0%	
22160.2	Procure Fab. Inlet Filter - L		9/26/00	9/26/00	0.60	0%	
22170	**Ancillary Support - L**		3/24/99	3/9/01	0	0%	
22170.1	Release, Final Design, Ancillary Support - L		8/5/99	8/5/99	0.40	0%	
22170.2	Procure Fab. Ancillary Support - L		3/9/01	3/9/01	0.60	0%	
22200	**Package Control & Indicating System - L**		3/31/98	12/15/0	0	0%	
22210	**Control Console - L**		3/31/98	12/15/00	0	0%	
22210.1	Release, Controls Spec. - L		5/1/98	5/1/98	0.15	0%	
22210.2	Release, Contorl Schematic / Wiring Drawing - L		6/15/98	6/15/98	0.25	0%	
22210.3	Assemble, Control Console - L		9/7/99	9/7/99	0.25	0%	
22210.4	Complete, Control Console Static Test - L		1/31/00	1/31/00	0.35	0%	
22220	**Lube Oil System - L**		3/31/98	8/26/99	0	0%	
22220.1	Release, Lube Oil System Schematic - L		5/31/98	5/31/98	0.40	0%	
22220.2	Release Final Design, Lube Oil System - L		7/8/98	7/8/98	0.60	0%	
22220.3	Procure, Lube Oil System Components- L		1/5/99	1/5/99	0	0%	
22220.4	Complete Fab, Lube Oil System - L		3/11/99	3/11/99	0	0%	
22230	**Package Fuel System - L**		6/5/98	2/29/00	0	0%	
22230.1	Release, Package Fuel System Schematic - L		11/2/98	11/2/98	0.40	0%	
22230.2	Release Final design, Package Fuel System - L		6/25/99	6/25/99	0	0%	
22230.3	Procure, Package Fuel System Components - L		12/16/99	12/16/99	0.60	0%	
22230.4	Complete Fab, Package Fuel System - L		2/29/00	2/29/00	0	0%	
22240	**Start System - L**		3/31/98	6/15/99	0	0%	
22240.1	Release Final Design, Start System - L		6/30/98	6/30/98	0.40	0%	
22240.2	Procure, Start System Components - L		3/22/99	3/22/99	0.60	0%	
22300	**Package Build - L**		8/6/99	2/14/02	0	0%	
22300.1	Develop, Package Build Book - L		1/5/00	1/5/00	0.10	0%	
22300.2	Review, Preproduction Design - L		3/8/00	3/8/00	0.15	0%	
22300.3	Complete Assy, Package #1 - L		1/8/01	1/8/01	0.20	0%	
22300.4	Complete Assy, Package #1 Enclosure - L		3/5/01	3/5/01	0.25	0%	
22300.5	Ship, Package #1 - L		5/17/01	5/17/01	0.30	0%	
22300.6	Complete Assy, Package #2 - L		3/7/01	3/7/01	0	0%	
22300.7	Complete Assy, Package #2 Enclosure - L		5/2/01	5/2/01	0	0%	
22300.8	Ship, Package #2 - L		7/19/01	7/19/01	0	0%	
22300.9	Complete Assy, DOE Demo Package #3 - L		5/14/01	5/14/01	0	0%	
22300.10	Complete Assy, DOE Demo Package #3 Enclosure - L		7/6/01	7/6/01	0	0%	
22300.11	Ship, DOE Demo Package #3 - L		2/14/02	2/14/02	0	0%	
22400	**O & M Manual / Illustrated Parts List - L**		7/9/99	9/18/00	0	0%	



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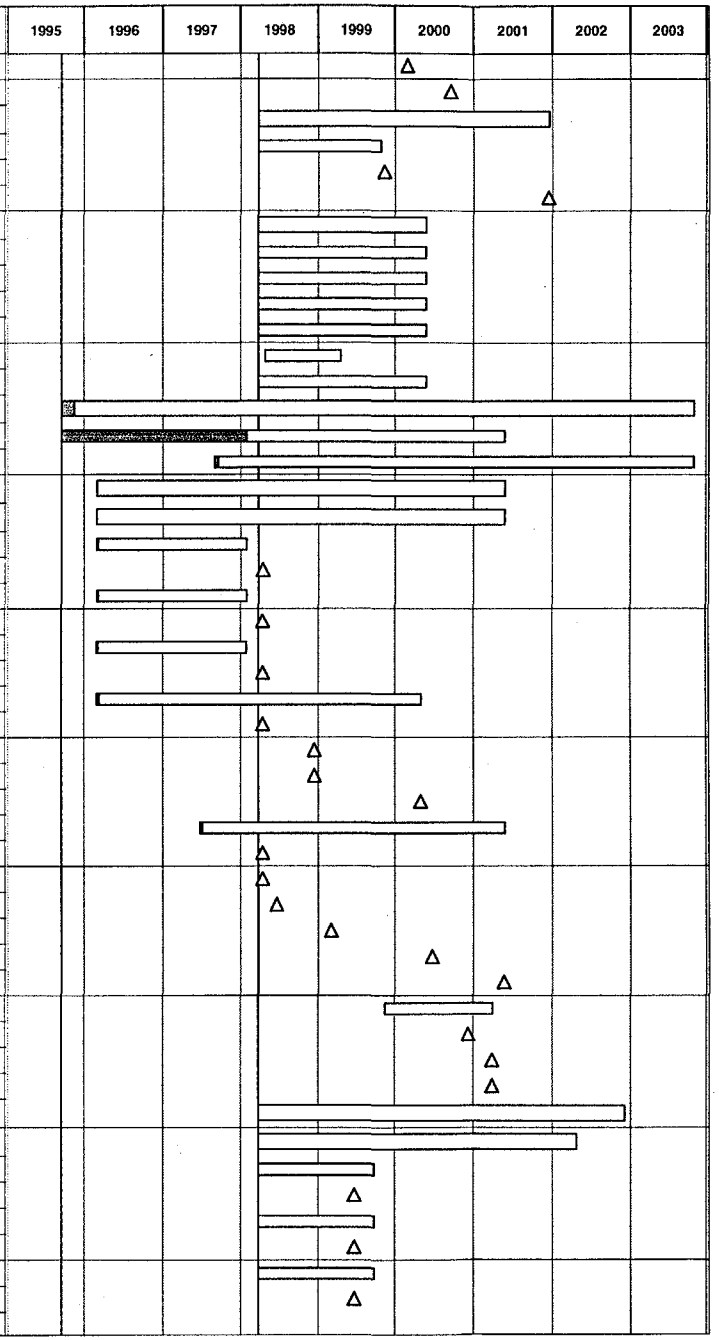
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
22400.1	First Draft, O & M Manual / Illustrated Parts List - L		3/1/00	3/1/00	0.40	0%	
22400.2	Publish, O & M Manual / Illustrated Parts List - L		9/18/00	9/18/00	0.60	0%	
27000	**Balance Of Plant - L**		**3/31/98**	**12/14/0**	**0**	**0%**	
27200	Balance Of Plant - L		3/31/98	10/22/99	0	0%	
27200.1	Release, Balance of Plant Design - L		11/12/99	11/12/99	0.40	0%	
27200.2	On Site - Balance of Plant - L		12/14/01	12/14/01	0.60	0%	
28000	**Tooling / Fixtures - L**		**3/31/98**	**5/23/00**	**0**	**0%**	
28100	Cold Section Tooling - L		3/31/98	5/23/00	0	0%	
28200	Hot Section Tooling - L		3/31/98	5/23/00	0	0%	
28300	Rotors Tooling - L		3/31/98	5/23/00	0	0%	
28500	Engine Assy Tooling - L		3/31/98	5/23/00	0	0%	
28600	Production Test Tooling - L		4/29/98	4/19/99	0	0%	
28700	Superior Gear Tooling - L		3/31/98	5/23/00	0	0%	
30000	**Product Support**		**9/14/95**	**10/30/0**	**0**	**2%**	
30100	Customer Services Coordination - S		9/14/95	5/21/01	0	42%	
30100	Customer Services Coordination - L		9/1/97	10/30/03	0	1%	
31000	**Product Support - S**		**3/1/96**	**5/21/01**	**0**	**0%**	
31100	**Product Support Planning - S**		**3/1/96**	**5/21/01**	**0**	**0%**	
31110	Product Support Plan - S		3/1/96	1/26/98	0	1%	
31110.1	Complete Product Support Plan - S		4/15/98	4/15/98	1.00	0%	
31120	Rec. Spare Parts List (RSPL) - S		3/1/96	1/26/98	0	1%	
31120.1	Complete, Spare Parts List - S		4/15/98	4/15/98	1.00	0%	
31130	Customer Services Provisioning Plan - S		3/1/96	1/26/98	0	1%	
31130.1	Complete Customer Support Provision Plan - S		4/15/98	4/15/98	1.00	0%	
31140	Service Support Plans - S		3/1/96	4/27/00	0	1%	
31140.1	Complete, Maintenance & Overhaul Plan - S		4/15/98	4/15/98	0.25	0%	
31140.2	Complete, Field Service Plan - S		12/17/98	12/17/98	0.25	0%	
31140.3	Complete, Warranty Plan - S		12/17/98	12/17/98	0.25	0%	
31140.4	Complete, Extended Warranty Plan - S		4/27/00	4/27/00	0.25	0%	
31200	Training - S		7/1/97	5/21/01	0	1%	
31200.1	Complete First Draft Information Handbook - S		4/15/98	4/15/98	0.10	0%	
31200.2	Publish Information Handbook - S		4/15/98	4/15/98	0.15	0%	
31200.3	Complete Training Plan - S		6/20/98	6/20/98	0.15	0%	
31200.4	Complete Course Material - S		3/8/99	3/8/99	0.15	0%	
31200.5	Begin Instructional Classes - S		6/22/00	6/22/00	0.10	0%	
31200.6	Complete Training - S		5/21/01	5/21/01	0.35	0%	
31300	Product Support Capital Items - S		11/19/99	3/28/01	0	0%	
31300.1	Complete, Overhaul Tooling - S		12/11/00	12/11/00	0.30	0%	
31300.2	Complete, Product Support Upgrades - S		3/28/01	3/28/01	0.35	0%	
31300.3	Complete, Product Support Equipment - S		3/28/01	3/28/01	0.35	0%	
32000	**Product Support - L**		**3/31/98**	**12/5/02**	**0**	**0%**	
32100	**Product Support Planning - L**		**3/31/98**	**4/24/02**	**0**	**0%**	
32110	Product Support Plan - L		3/31/98	9/20/99	0	0%	
32110.1	Complete, Product Support Plan - L		6/23/99	6/23/99	1.00	0%	
32120	Recom. Spare Parts List - L		3/31/98	9/20/99	0	0%	
32120.1	Complete, Recom. Spare Parts Lists - L		6/23/99	6/23/99	1.00	0%	
32130	Customer Services Provisioning Plan - L		3/31/98	9/20/99	0	0%	
32130.1	Complete, Services Provisioning Plan - L		6/23/99	6/23/99	1.00	0%	



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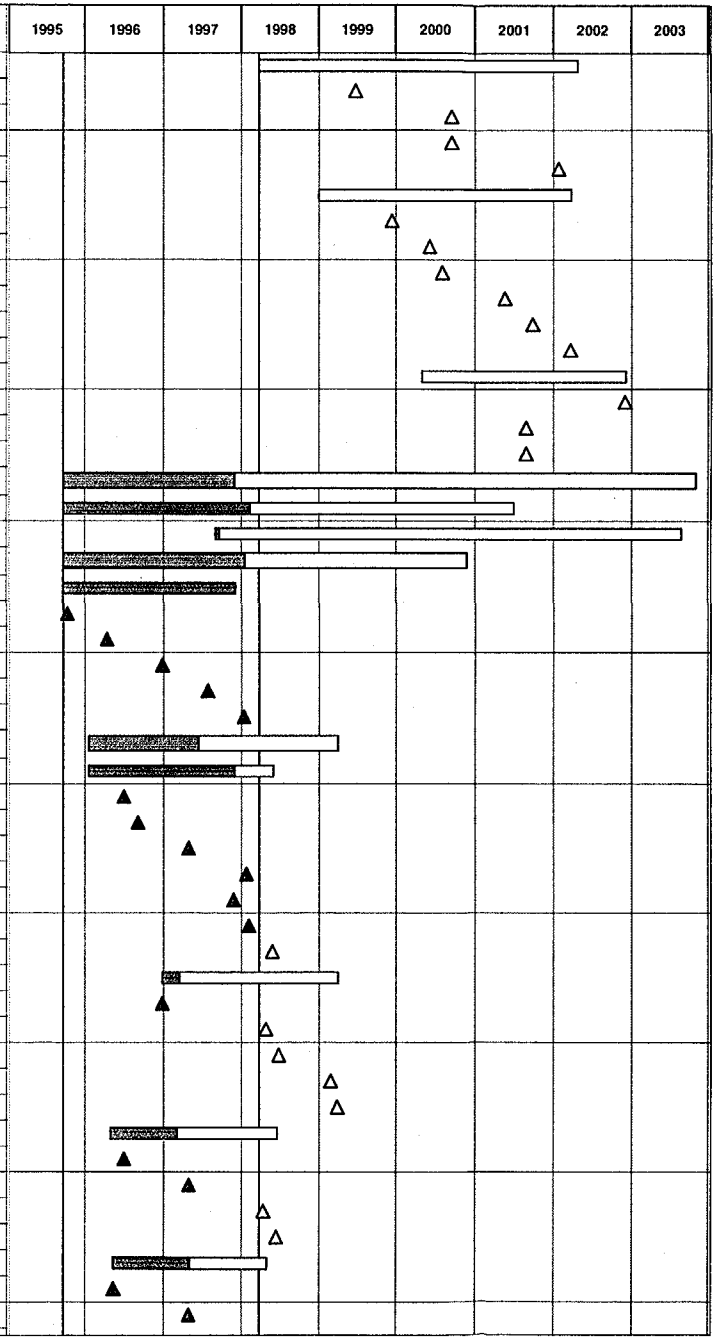
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
32140	Service Support Plans - L		3/31/98	4/24/02	0	0%	
32140.1	Complete, Maintenance & Overhaul Plan - L		6/23/99	6/23/99	0.25	0%	
32140.2	Complete, Field Service Plan - L		9/15/00	9/15/00	0.25	0%	
32140.3	Complete, Warranty Plan - L		9/15/00	9/15/00	0.25	0%	
32140.4	Complete, Extended Warranty Plan - L		1/29/02	1/29/02	0.25	0%	
32200	Training - L		1/4/99	3/26/02	0	0%	
32200.1	Complete First Draft, Information Handbook - L		12/9/99	12/9/99	0.10	0%	
32200.2	Complete, Training Plan - L		6/5/00	6/5/00	0.15	0%	
32200.3	Publish, Information Handbook - L		8/1/00	8/1/00	0.15	0%	
32200.4	Complete, Course Material - L		5/21/01	5/21/01	0.15	0%	
32200.5	Begin, Instruction - L		9/28/01	9/28/01	0.10	0%	
32200.6	Complete Training - L		3/26/02	3/26/02	0.35	0%	
32300	Product Support Capital Items - L		5/1/00	12/5/02	0	0%	
32300.1	Complete Product Support Upgrades - L		12/5/02	12/5/02	0.30	0%	
32300.2	Complete, Product Support Equipment - L		8/30/01	8/30/01	0.35	0%	
32300.3	Complete, Overhaul Tooling - L		8/30/01	8/30/01	0.35	0%	
40000	**Test & Evaluation**		**9/14/95**	**10/30/0**	**0**	**27%**	
40100	Test Coordination - S		9/14/95	6/29/01	0	42%	
40100	Test Coordination - L		9/1/97	8/20/03	0	1%	
42000	**Component Testing - S**		**9/14/95**	**11/21/0**	**0**	**45%**	
42100	Compressor Rig Test - ACE		9/14/95	12/1/97	0	100%	
42100.1	Deliver Design to Agilis, Compressor Rig - ACE		10/3/95	10/3/95	0.10	100%	
42100.2	Complete Design, Compressor Rig - ACE		4/10/96	4/10/96	0.25	100%	
42100.3	Complete Assembly, Compressor Rig - ACE		12/30/96	12/30/96	0.25	100%	
42100.4	Complete Test, Compressor Rig - ACE		7/31/97	7/31/97	0.25	100%	Added Test Scope
42100.5	Complete Test Report, Compressor Rig - ACE		1/15/98	1/15/98	0.15	100%	
42200	**Combustor Rig Test - S**		**1/16/96**	**3/31/99**	**0**	**44%**	
42210	ULP Combustion Rig Test - S		1/16/96	5/29/98	0	80%	
42210.1	Complete Mod, Single Sector Combustor Rig - S		6/28/96	6/28/96	0.10	100%	
42210.2	Start Design, ULP Combustor Rig - S		9/1/96	9/1/96	0.10	100%	
42210.2	Complete Design, ULP Combustor Rig - S		4/30/97	4/30/97	0.15	100%	
42210.3	Complete Fab, ULP Combustor Rig - S		1/30/98	1/30/98	0.15	100%	
42210.4	Complete Tests, Single Sector Combustor Rig - S		11/30/97	11/30/97	0.15	100%	
42210.5	Start Tests, ULP Combustor Rig - S		2/11/98	2/11/98	0.15	100%	
42210.6	Complete Tests, ULP Combustor Rig - S		5/31/98	5/31/98	0.20	0%	
42220	Catalytic Combustion Rig Test - S		12/31/96	3/31/99	0	10%	
42220.1	Start Design, Catalytic Combustor Rig - S		12/31/96	12/31/96	0.10	100%	
42220.2	Complete Design, Catalytic Combustion Rig - S		5/1/98	5/1/98	0.15	0%	
42220.3	Start Tests, Catalytic Combustion Rig - S		6/30/98	6/30/98	0.10	0%	
42220.4	Complete Tests, Catalytic Combustion Rig - S		2/28/99	2/28/99	0.25	0%	
42220.5	Complete Topical Report, Catalytic Combustion Rig -		3/31/99	3/31/99	0	0%	
42400	Turbine Rig Test - S		5/1/96	6/15/98	0	40%	
42400.1	Design to CAT Tech Ctr, Turbine Rig - S		6/28/96	6/28/96	0.15	100%	
42400.2	Complete Design, Turbine Rig - S		4/30/97	4/30/97	0.25	100%	
42400.3	Complete Assy, Turbine Rig - S		4/17/98	4/17/98	0.25	0%	
42400.4	Complete Test, Turbine Rig - S		6/15/98	6/15/98	0.35	0%	
42500	Squeeze Film Damper Test - S		5/10/96	4/30/98	0	50%	
42500.1	Start Design, Squeeze Film Damper Rig - S		5/10/96	5/10/96	0.10	100%	
42500.2	Complete Assy, Squeeze Film Damper Rig - S		4/30/97	4/30/97	0.40	100%	



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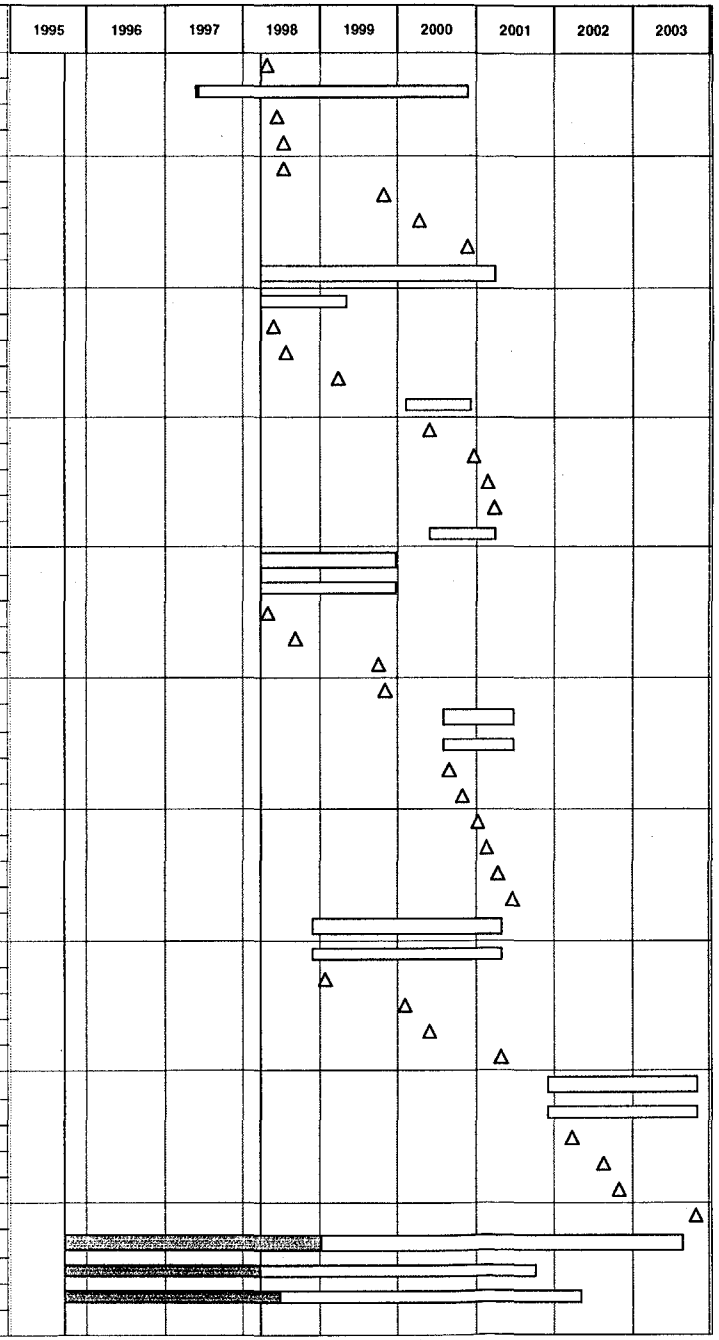
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
42500.3	Complete Tests, Squeeze Film Damper Rig - S		4/30/98	4/30/98	0.50	0%	Alternate Design being tested.
42600	In-House Engine Test - S		6/1/97	11/21/00	0	1%	
42600.1	Start Build, Engine # 1 - S		6/15/98	6/15/98	0.05	0%	
42600.2	Start Dev Test, Engines # 1 & 2 - S		7/15/98	7/15/98	0.10	0%	
42600.3	Start Build, Engine # 2 (DOE) - S		7/15/98	7/15/98	0.10	0%	
42600.4	Complete, Engine # 2 (DOE) Test - S		10/31/99	10/31/99	0.25	0%	
42600.5	Complete, Engine # 1 ULP Test - S		4/10/00	4/10/00	0.25	0%	
42600.6	Complete, Engine # 1 Catalytic Test - S		11/21/00	11/21/00	0.25	0%	
42000	**Component Testing - L**		**3/31/98**	**3/30/01**	**0**	**0%**	
42300	Combustor Rig Test - L		3/31/98	4/29/99	0	0%	
42300.1	Complete Design, Combustor Rig - L		5/31/98	5/31/98	0	0%	
42300.2	Complete Assy, Combustor Rig - L		7/31/98	7/31/98	0	0%	
42300.3	Complete Tests, Combustor Rig - L		3/31/99	3/31/99	0	0%	
42700	In-House Engine Test - L		2/11/00	12/4/00	0	0%	
42700.1	Start Tests, Engine #1 - L		6/1/00	6/1/00	0	0%	
42700.2	Complete Prod. Test, Engine #2 - L		12/22/00	12/22/00	0	0%	
42700.3	Complete Prod. Test, Engine #3 - L		2/28/01	2/28/01	0	0%	
42700.4	Complete Prod. Test, DOE Demo Engine #1 - L		3/30/01	3/30/01	0	0%	
42800	Compressor Rig Test - L		6/1/00	3/30/01	0	0%	
43100	**System Test / Demo - S**		**3/31/98**	**12/16/9**	**0**	**0%**	
43100	Engine & Package Test / Demo - S		3/31/98	12/16/99	0	0%	
43100.1	Release, Engine Acceptance Test Specification - S		5/5/98	5/5/98	0.15	0%	
43100.2	Release, Package Test Specification - S		9/9/98	9/9/98	0.15	0%	
43100.3	Start Test, Package / Engine # 2 (DOE) - S		10/5/99	10/5/99	0.30	0%	
43100.4	Complete Demo, Package / Engine # 2 (DOE) - S		11/1/99	11/1/99	0.40	0%	
43200	**System Test / Demo - L**		**8/4/00**	**6/21/01**	**0**	**0%**	
43200	Engine & Package Test / Demo - L		8/4/00	6/21/01	0	0%	
43200.1	Release, Engine Acceptance Test Specification - L		8/31/00	8/31/00	0.15	0%	
43200.2	Release, Package Test Specification - L		10/27/00	10/27/00	0.15	0%	
43200.3	Start Test, Package #1 - L		1/9/01	1/9/01	0.30	0%	
43200.4	Complete Acceptance, Package #1 - L		2/19/01	2/19/01	0	0%	
43200.5	Complete Acceptance, Package #2 - L		4/18/01	4/18/01	0	0%	
43200.6	Complete Acceptance, DOE Demo Package #3 - L		6/21/01	6/21/01	0.40	0%	
44100	**Host Site Test & Evaluation - S**		**12/1/98**	**4/30/01**	**0**	**0%**	
44100	Host Site Test & Evaluation - S		12/1/98	4/30/01	0	0%	
44100.1	Release, System Test Plan - S		1/27/99	1/27/99	0.10	0%	
44100.2	Deliver Host Site Service Parts - S		2/2/00	2/2/00	0.15	0%	
44100.3	Commission, ATS System - S		5/31/00	5/31/00	0.25	0%	
44100.4	Complete, Host Site Evaluation - S		4/30/01	4/30/01	0.45	0%	
44200	**Host Site Test & Evaluation - L**		**12/3/01**	**10/30/0**	**0**	**0%**	
44200	Host Site Test & Evaluation - L		12/3/01	10/30/03	0	0%	
44200.1	Release, System Test Plan - L		3/27/02	3/27/02	0.10	0%	
44200.2	Deliver Host Site Service Part - L		8/20/02	8/20/02	0.15	0%	
44200.3	Commission, ATS System - L		11/1/02	11/1/02	0.25	0%	
44200.4	Complete, Host Site Evaluation - L		10/30/03	10/30/03	0.45	0%	
50000	**Program Management**		**9/14/95**	**8/20/03**	**0**	**42%**	
50100	Program Coordination		9/14/95	10/1/01	0	42%	
50200	Management Reserve		9/14/95	5/7/02	0	42%	



Advanced Turbine Systems
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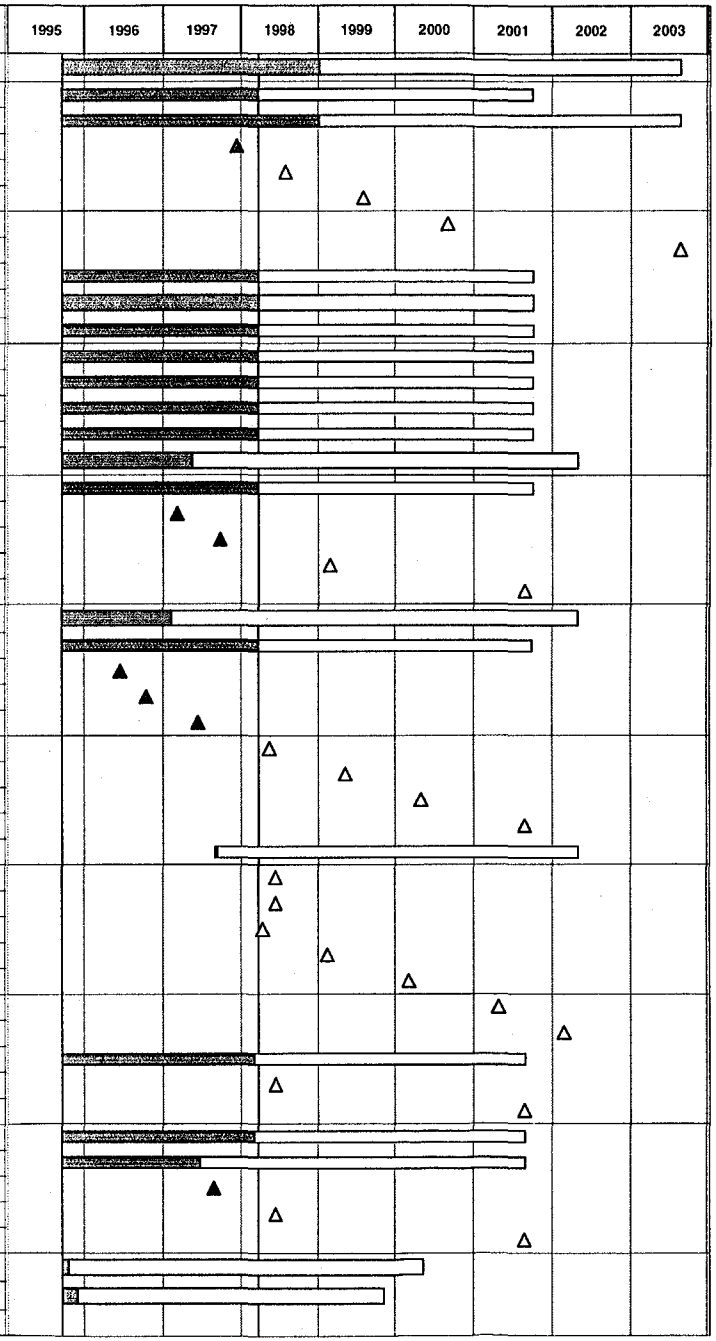
WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
51000	**Customer Present. & Reports**		**9/14/95**	**8/20/03**	**0**	**42%**	
51100	Periodic Reports		9/14/95	10/1/01	0	42%	
51200	Special Reports		9/14/95	8/20/03	0	42%	
51200.1	Complete, Buget Period II Cost Proposal		12/15/97	12/15/97	0	100%	Rescheduled One Year Later, 12/96
51200.2	Complete, Phase 3A Progress Report		8/6/98	8/6/98	0	0%	Rescheduled One Year Later, 12/96
51200.3	Complete, Phase 4 Cost Proposal		8/6/99	8/6/99	0	0%	Rescheduled One Year Later, 12/96
51200.4	Complete, Phase 3B Progress Report		9/3/00	9/3/00	0	0%	Rescheduled One Year Later, 12/96
51200.5	Complete, Phase 4 Final Report		8/20/03	8/20/03	0	0%	Rescheduled One Year Later, 12/96
51300	Reviews & Presentations		9/14/95	10/1/01	0	42%	
52000	**Project Support**		**9/14/95**	**10/1/01**	**0**	**42%**	
52100	Business Management		9/14/95	10/1/01	0	42%	
52200	Contract Administration		9/14/95	10/1/01	0	42%	
52300	Cost / Schedule Control		9/14/95	10/1/01	0	42%	
52400	Marketing Coordination		9/14/95	10/1/01	0	42%	
52500	Product Cost Management		9/14/95	10/1/01	0	42%	
60000	**Commercialization**		**9/14/95**	**5/1/02**	**0**	**26%**	
61000	Market Development		9/14/95	10/1/01	0	42%	
61000.1	Complete, Market Strategy & Commercialization Plan		3/14/97	3/14/97	0.15	100%	Completed Draft
61000.2	Complete, Market Readiness Plan - Prelim		9/30/97	9/30/97	0.10	100%	
61000.3	Start, Market Plan Implemention		3/1/99	3/1/99	0.25	0%	
61000.4	Complete, Market Plan Implementation		8/31/01	8/31/01	0.50	0%	
62000	**Manufacturing Readiness**		**9/14/95**	**5/1/02**	**0**	**21%**	
62100	Production Implementation - S		9/14/95	9/28/01	0	42%	
62100.1	Complete, Production Tooling Plan - S		6/14/96	6/14/96	0.10	100%	
62100.2	Complete, Production Equipment Requirements - S		10/17/96	10/17/96	0.15	100%	
62100.3	Complete, Equipment Design & Facility Requirements - S		6/16/97	6/16/97	0.15	100%	
62100.4	Complete, Equip Acquisition & Facilities Rearrange - S		5/15/98	5/15/98	0.15	0%	
62100.5	Complete Equip Installation, Manpower Acquisition - S		5/13/99	5/13/99	0.15	0%	
62100.6	Start, Production - S		4/27/00	4/27/00	0.15	0%	
62100.7	Complete, Production Implementation - S		8/30/01	8/30/01	0.15	0%	
62200	Production Implementation - L		9/2/97	5/1/02	0	1%	
62200.1	Complete, Production Tooling Plan - L		6/15/98	6/15/98	0.10	0%	
62200.2	Complete, Production Equipment Requirements - L		6/15/98	6/15/98	0.15	0%	
62200.3	Complete, Equipment Design & Facility Requirements - L		4/15/98	4/15/98	0.15	0%	
62200.4	Complete, Equip Acquisition & Facilities Rearrange - L		2/17/99	2/17/99	0.15	0%	
62200.5	Complete, Equip Installation, Manpower Acquisition - L		3/2/00	3/2/00	0.15	0%	
62200.6	Start, Production - L		4/27/01	4/27/01	0.15	0%	
62200.7	Complete, Production Implementation - L		2/28/02	2/28/02	0.15	0%	
63000	Spin-Off Technology Plan		9/14/95	8/31/01	0	42%	
63000.1	Complete, Preliminary Spin Off Technology Plan		6/15/98	6/15/98	0.40	0%	
63000.2	Complete, Final Spin Off Technology Plan		8/31/01	8/31/01	0.60	0%	
64000	Life-Cycle Cost Analysis		9/14/95	8/31/01	0	42%	
65000	RAMD		9/14/95	8/31/01	0	30%	
65000.1	Complete, RAMD System Spec		8/27/97	8/27/97	0.30	100%	
65000.2	Complete, RAMD Software & Hardware Procurement		6/15/98	6/15/98	0.30	0%	
65000.3	Complete, RAMD Demonstration		8/31/01	8/31/01	0.35	0%	
70000	**Host Sites**		**9/14/95**	**5/2/00**	**0**	**2%**	
71000	**Host Site - S**		**9/14/95**	**11/1/99**	**0**	**5%**	



Advanced Turbine Systems
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WBS	Task Name	Dwg / Part No	Start Date	End Date	Value	Percent Complete	Notes
71100	Host Site Research & Selection - S		9/14/95	5/30/97	0	100%	
71100.1	Complete, Host Site Research - S		9/14/96	9/14/96	0.40	100%	
71100.2	Complete, Host Site Selection - S		5/31/97	5/31/97	0.60	100%	
71200	Host Site Design - S		10/1/97	1/12/99	0	1%	
71200.1	Complete, Host Site Conversion Plan - S		5/31/98	5/31/98	0.40	0%	
71200.2	Complete Design, Host Site - S		11/30/98	11/30/98	0.60	0%	
71300	Host Site Construction - S		10/1/98	11/1/99	0	0%	
71300.1	Complete Construction, Host Site - S		11/1/99	11/1/99	1.00	0%	
72000	**Host Site - L**		**10/1/97**	**5/2/00**	**0**	**0%**	
72100	Host Site Research & Selection - L		10/1/97	12/18/98	0	1%	
72100.1	Complete, Host Site Research - L		5/1/98	5/1/98	0.35	0%	
72100.2	Complete, Host Site Selection - L		12/18/98	12/18/98	0.65	0%	
72200	Host Site Design - L		10/22/98	10/7/99	0	0%	
72200.1	Complete, Host Site Conversion Plan - L		2/22/99	2/22/99	0.25	0%	
72200.2	Complete Design, Host Site - L		10/7/99	10/7/99	0.75	0%	
72300	Host Site Construction - L		10/8/99	5/2/00	0	0%	
72300.1	Complete Construction, Host Site - L		5/2/00	5/2/00	1.00	0%	
80000	**Industrial Facilities**		**5/1/97**	**2/28/00**	**0**	**27%**	
81000	Test Cells - S		5/1/97	5/12/98	0	65%	
81000.1	Complete A/R, Test Cell Facility - S		12/1/97	12/1/97	0.15	100%	
81000.2	Complete Permits, Test Cell Facility - S		1/9/98	1/9/98	0.25	100%	
81000.3	Start Construction, Test Cell Facility - S		1/12/98	1/12/98	0.25	100%	
81000.4	Complete Checkout, Test Cell Facility - S		6/15/98	6/15/98	0.35	0%	
82000	Test Cells - L		12/1/98	2/28/00	0	0%	
82000.1	Complete A/R, Test Cell Facility - L		1/12/99	1/12/99	0.15	0%	
82000.2	Complete Permits, Test Cell Facility - L		5/18/99	5/18/99	0.25	0%	
82000.3	Start Construction, Test Cell Facility - L		10/1/99	10/1/99	0.25	0%	
82000.4	Complete Checkout, Test Cell Facility - L		2/28/00	2/28/00	0.35	0%