96/03016 Enhancing gas-turbine engine performance by means of the evaporative regenerative cycle
Najjar, Y. S. and Zaamout, M. S. *J. Inst. of Energy,* Mar. 1996, 69, (478), 2-8.
The gas-turbine engine has relatively poor performance at part-load, and power output deteriorates during the hot season. Therefore the use of water injection in a regenerative cycle, utilising the exhaust waste energy in the recuperator and the water-heater, is expected to recover the de-rated power and improve the fuel economy at lower cost and higher reliability than in the combined cycle. In this research the performacne of the evaporative regenerative cycle ERC is analysed parametrically, taking as the main variables the compressor pressure-ratio R_c, turbine inlet temperature T_{03}, and water:air ratio w. A specially designed computer program was tailored for the analysis, where the main variable are changed over wide ranges. The relative effect of water injection is demonstrated by comparison of ERC wtih an equivalent regenerative cycle RC.

96/03017 Erosion-corrosion modeling of gas turbine materials for coal-fired combined cycle power generation
Simms, N. J. *et al., Wear,* 1995, 186, (1), 247-255.
Describes the development and testing of erosion-corrosion models for use in gas turbine environments. The models successfully predicted the materials damage observed in the pilot plant environments.

96/03018 Exergy analysis and design of mixed CO_2/steam gas turbine cycles
Bram, S. and De Ruyck, J. *Energy Convers. Mgmt.,* Jun.-Sep. 1995, 36, (6), 845-848.
The capturing and disposal of CO_2 from power plant exhaust gases is a possible route for reducing CO_2 emissions. The paper investigates the full recirculation of exhaust gases in a gas turbine cycle, combined with the injection of steam or water. Such recirculation leads to an exhaust gas with very high CO_2 concentration (95% or more). Different regenerative cycle layouts are proposed and analyzed for efficiency, exergy destruction and technical feasibility. Pinch Technology methods are next applied to find the best configuration for heat regeneration and injection of water. From this analysis, dual pressure evaporation with water injection in the intercooler emerges as an interesting option.

96/03019 Financial implications on power generation costs resulting from the parasitic effect of CO_2 capture using liquid scrubbing technology from power station flue gases
Leci, C. L. *Energy Convers. Mgmt.,* Jun.-Aug. 1996, 37, (6), 915-921.
Discusses four power generation options covering the spectrum of methods and fossil fuel power generation which were used as the base cases to determine the resultant increase in base case levelized generating costs resulting from CO_2 capture from the flue gas of a 500 MW_e power station by liquid scrubbing technology.

96/03020 Firing steelworks recovery gases in a combined-cycle power station
Milani, A. *et al., J. Inst. of Energy,* Mar. 1996, 69, (478), 15-22.
A new cogeneration power plant producing 500 MW_e and 140 t h^{-1} of process steam is under construction at the ILP iron and steel works in Taranto (Southern Italy). It will be fired with recovery gases by-produced in the integral iron- and steelmaking process. Commissioning is due in 1996. The plant is divided into three equal modules, each comprising a gas-turbine exhausting into a recovery boiler where steam at 100 bar and 540°C is produced for process purposes and for generating electricity. In the discussion of the basic design, boundary constraints are taken into account. The problems encountered in gas-cleaning and in firing a very lean fuel mixture in the gas-turbine are discussed, with emphasis on the difficulties arising from changes of composition in the recovery gaes.

96/03021 ICAD offers 60 per cent efficient turbine cycles
MPS, Modern Power Systems, Jan. 1996, 16, (1), 23, 25, 27.
Intercooled aeroderivative (ICAD) gas turbines in the 100 MW range were targeted as the advanced gas turbine cycle which was most attractive for near term development by the CAGT (Collaborative Advanced Gas Turbine) research programme. The selection was based on market attractiveness to users across a range of intermediate load simple cycle, mid-sized combined cycle, feedwater preheating repowering and cogeneration applications. Discusses the current interest in ICAD turbine systems.

96/03022 Improving coal-fired power generation by integrating PFBC and gas-fired combined cycles in a hybrid process
Evans, R. H. *et al., Int. J. Energy Research,* Feb. 1996, 20, (2), 107-123.
The paper examines two hybrid combined cycle electrical power generating schemes burning coal and natural gas using the ECLIPSE chemical process simulator. The results of these simulations are presented and analyzed. Comparison is made with conventional power generation technologies. Two additional pieces of work are included. The first examines the effect of the hot gas filtration operating conditions on the hybrid combined cycle efficiency and the second calculates the allowable increase in capital cost for a specified improvement in power plant efficiency while maintaining the same cost of electricity.

96/03023 Industrial Trent operates – DLE RB211 meets targets
MPS, Modern Power Systems, Nov. 1995, 15, (11), 49, 51-52.
The Rolls Royce industrial Trent, a 50 MW aero-derivative gas turbine with a thermal efficiency of 42% in simple cycle, made its first test bed run in September 1995. The engine uses the advanced DLE dry low emissions combustor concept which was recently demonstrated to have met its design goals in the industrial RB 211 engine.

96/03024 Jandar begins Syria's GTCC era
Pietila, S. *MPS, Modern Power Systems,* Jan. 1996, 16, (1), 33, 35, 37.
Reports that Syria has installed a 700 MWe combined cycle power plant at Jandar to meet the increasing power demand. The plant, which was built under a turnkey contract by Mitsubishi Heavy Industries, is the country's first combined cycle power station.

96/03025 Life cycle analysis of fossil power plant with CO_2 recovery and sequestering system
Waku, H. *et al., Energy Convers. Mgmt.,* Jun.-Sep. 1995, 36, (6), 877-880.
Life cycle energy balance and carbon dioxide emission have been evaluated for LNG combined cycle and integrated coal gasification combined cycle (IGCC) power generation system with carbon dioxide capture and sequestering technologies. The study gave a prediction that CO_2 recovery and sequestration would lower the net energy ratio by 16% to 61%. CO_2 emission control potential was estimated to be in the range of 61% to 76%.

96/03026 Mathematical modeling of brush seals
Chew, J. W. *et al., Int. J. Heat & Fluid Flow,* Dec. 1995, 16, (6), 493-500.
A computational fluid dynamics (CFD)-based model of brush seals has been developed and tested against other workers' experimental data. In the model, the brush is treated as an axisymmetric, anisotropic porous region with nonlinear resistance coefficients. The resistance coefficients are chosen through calibration against measurements. The CFD model gives predictions of flow rate, pressure distribution, velocity field, and bending forces on the bristles.

96/03027 Medium speed 4 stroke ZA50S extends range to 21 600 kW
MPS, Modern Power Systems, Dec. 1995, 15, (12), 61, 63.
At the public inauguration of New Sulzer Diesel's Diesel Technology Center, a major new power unit was introduced to the market. Extending the range of the ubiquitous ZA40S medium speed four-stroke diesel engine to new dimensions of output capacity, the ZA50S in V18 cylinder form will produce some 21 600 kW.

96/03028 Performance evaluation of fossil power plant with CO_2 recovery and sequestering system
Akai, M. *et al., Energy Convers. Mgmt.,* Jun.-Sep. 1995, 36, (6), 801-804.
Performance of various combinations of power generation, CO_2 capture and sequestering technologies which may become practicable in the first decade of the next century has been evaluated. The study gave a prediction that CO_2 recovery and sequestration would lower the net power generating efficiency by 12.5% to 32.8% and increase the power generation cost to between 1.3 to 2.3 times the level for reference case without CO_2 emission control.

96/03029 Power plants with CO_2 capture using integrated air separation and flue gas recycling
Shao, Y. and Golomb, D. *Energy Convers. Mgmt.,* Jun.-Aug. 1996, 37, (6), 903-908.
Natural gas and synthetic gas fired power plants are investigated in this paper.

96/03030 Proposal for a high efficiency power generation system with CO_2 recovery by oxygen-coal-fired MHD-steam combined cycle
Ishikawa, M. and Umoto, J. *Energy Convers. Mgmt.,* Jun.-Sep. 1995, 36, (6), 809-812.
Discusses how oxygen-fired MHD-steam combined cycle can achieve 46% of cycle efficiency even when CO_2 is recovered from exhaust gas, which is very high compared with 30% of conventional power systems with CO_2 recovery. Advanced MHD cycle without CO_2 recovery achieves very high efficiency of more than 60%, if high temperature air heater and wall temperature can be realized.