Power Systems Development Facility

Jim Longanbach

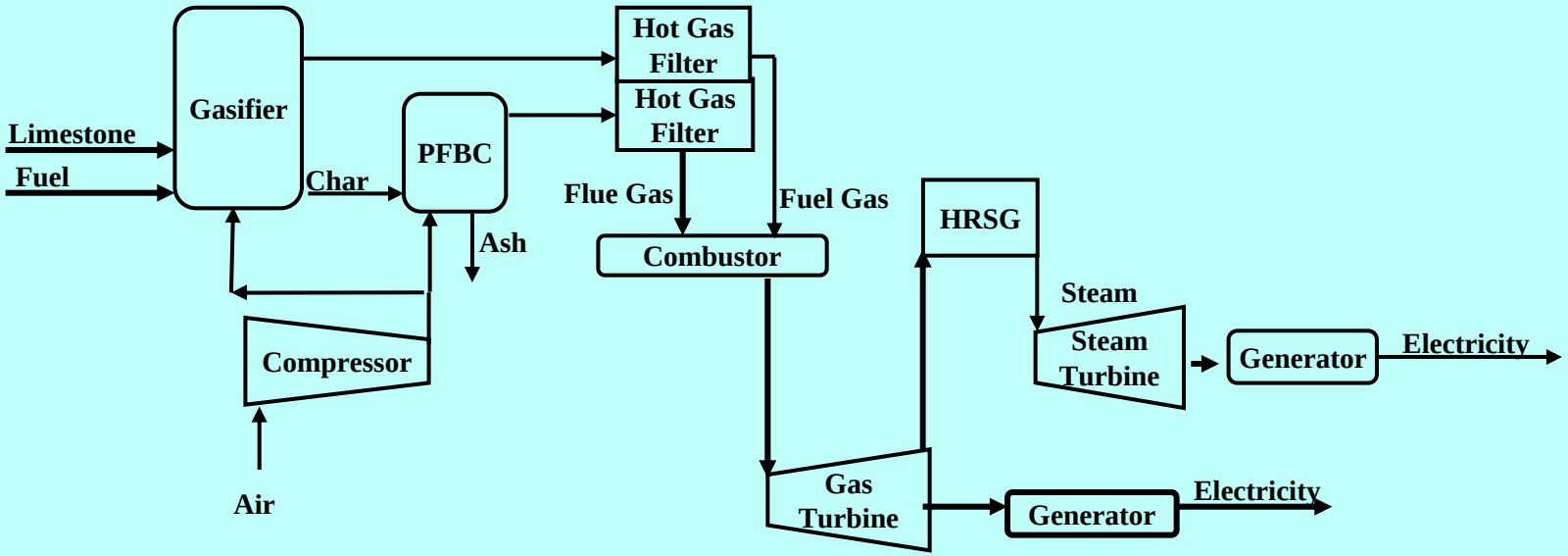
January 26, 2000

FETC

PSDF Goals and Objectives

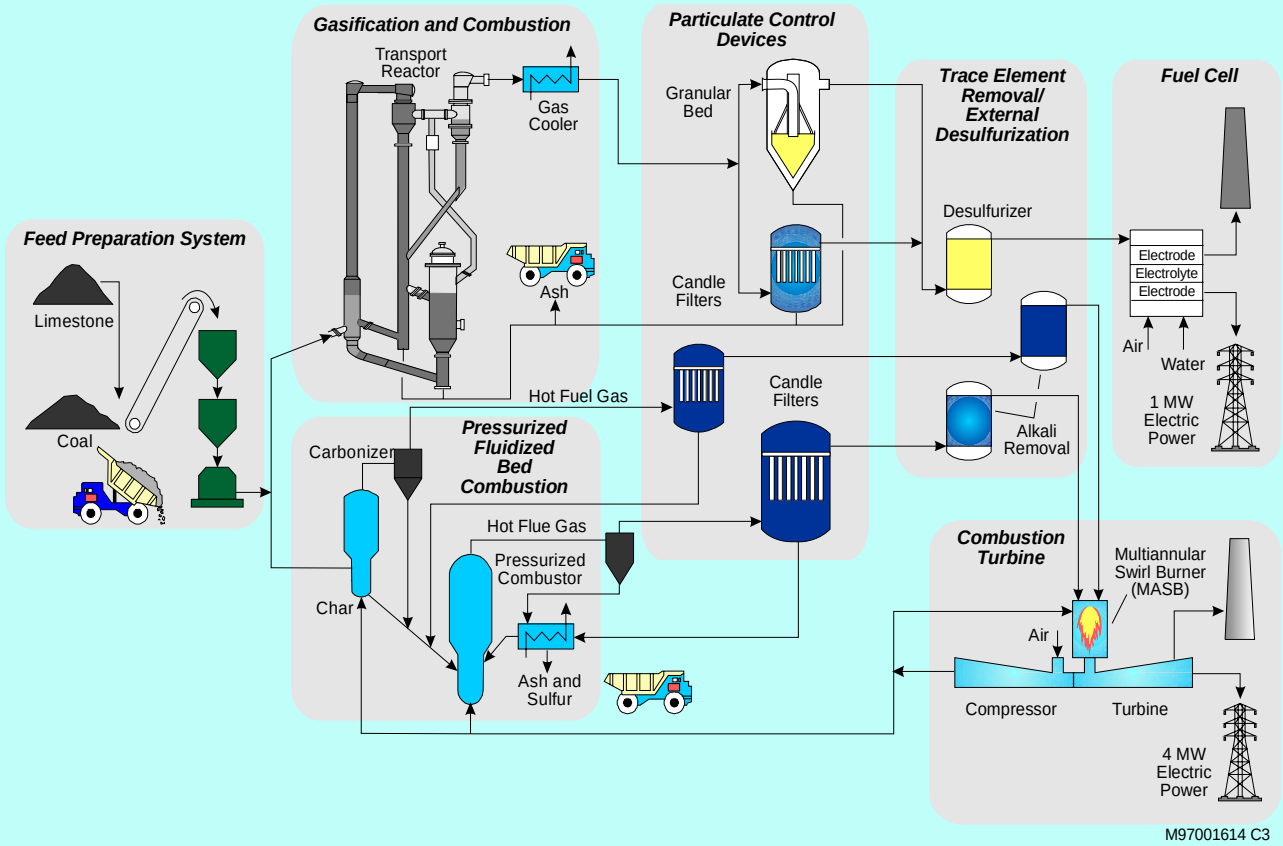
- **Test power system components and integrated systems under realistic conditions**
  - Hot gas filters a critical technology
- **Provide data for scaleup**
  - Key step between pilot plant and demonstration
  - Utility site adds credibility and aids technology transfer
- **Extension of FETC**
  - Test inventions, verify models, develop staff
- **Develop an advanced, competitive coal-based power generation technology**

Hybrid Coal-Based Power Production
Flow Diagram

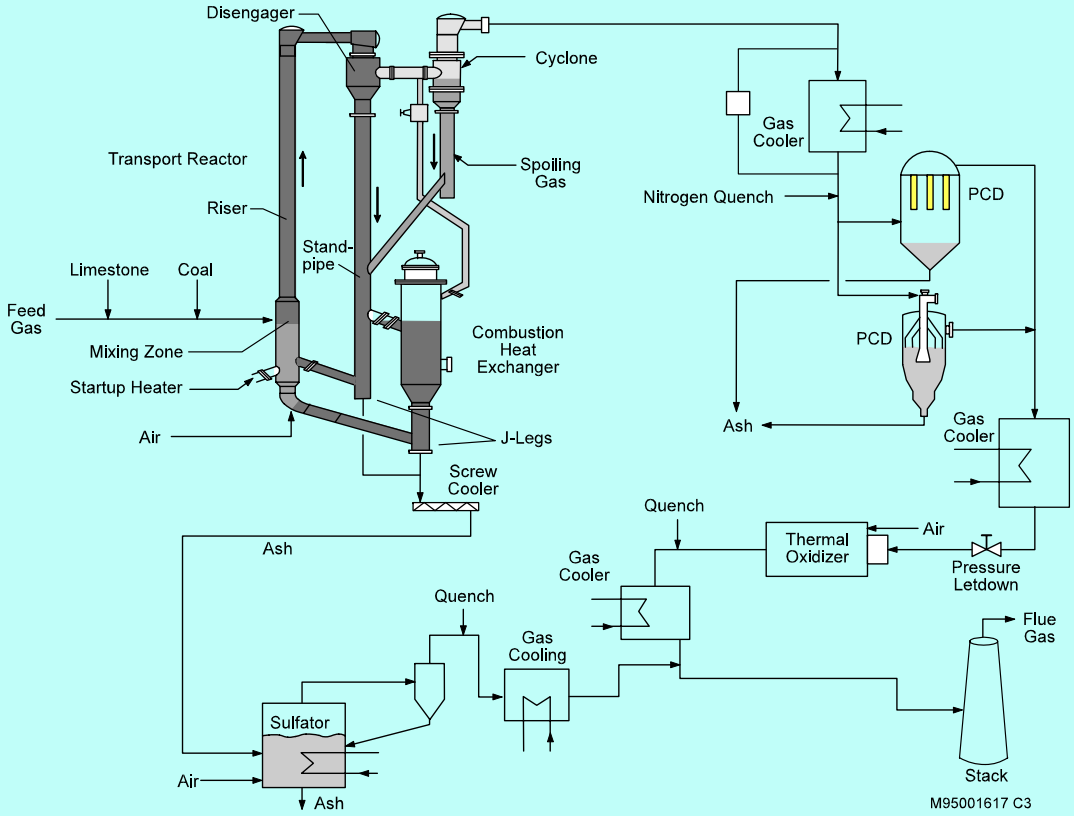


Power Systems Development Facility

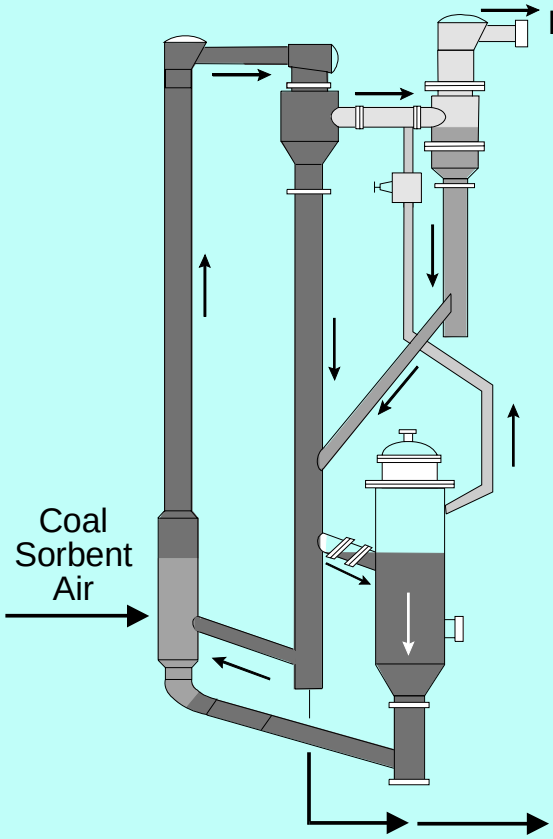
Simplified Flow Diagram



KBR Transport Reactor



Transport Reactor Flow Diagram



Advantages of Pressurized Transport Reactor

- Excellent Gas-Solids Contact
- Low Mass Transfer Resistance Between Gas and Solids
- Highly Turbulent Atmosphere
- High Coal Throughput
- High Heat Release Rate

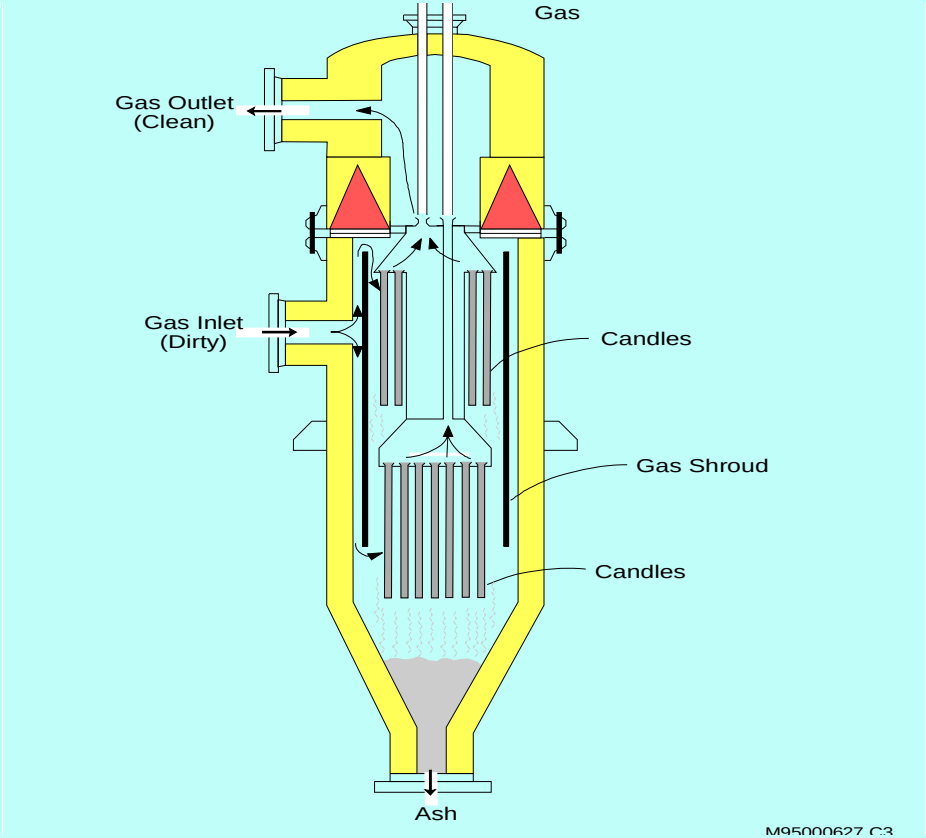
M98000061C

FETC

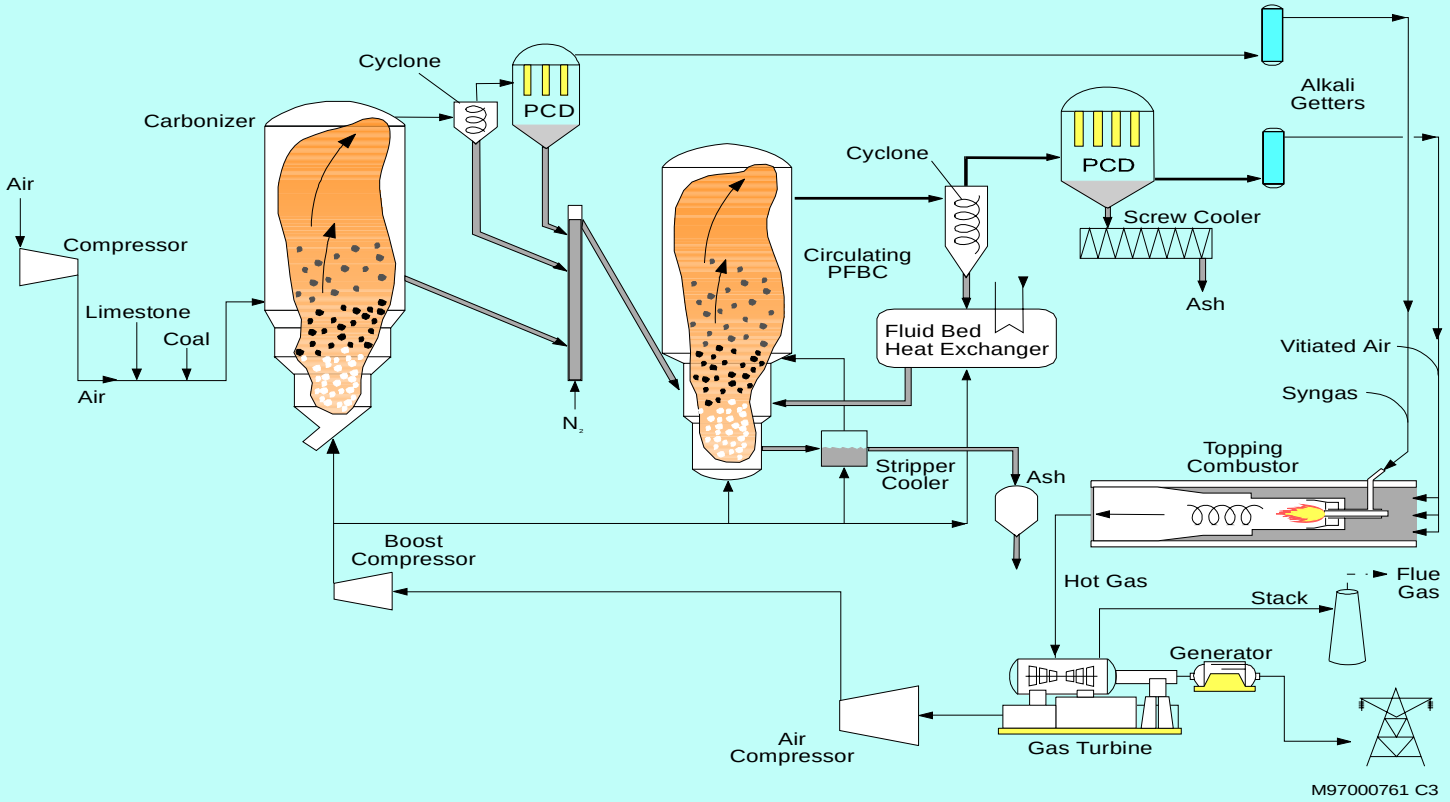
FY 2000 Planned Accomplishments and Issues - Transport Reactor

- Complete shakedown of Transport Reactor as a gasifier
- Operate and test PCD for 1000 hours under gasification conditions
- Provide test gas to the RTI DSRP test unit

Siemens-Westinghouse Candle Filter



Foster Wheeler Advanced PFBC

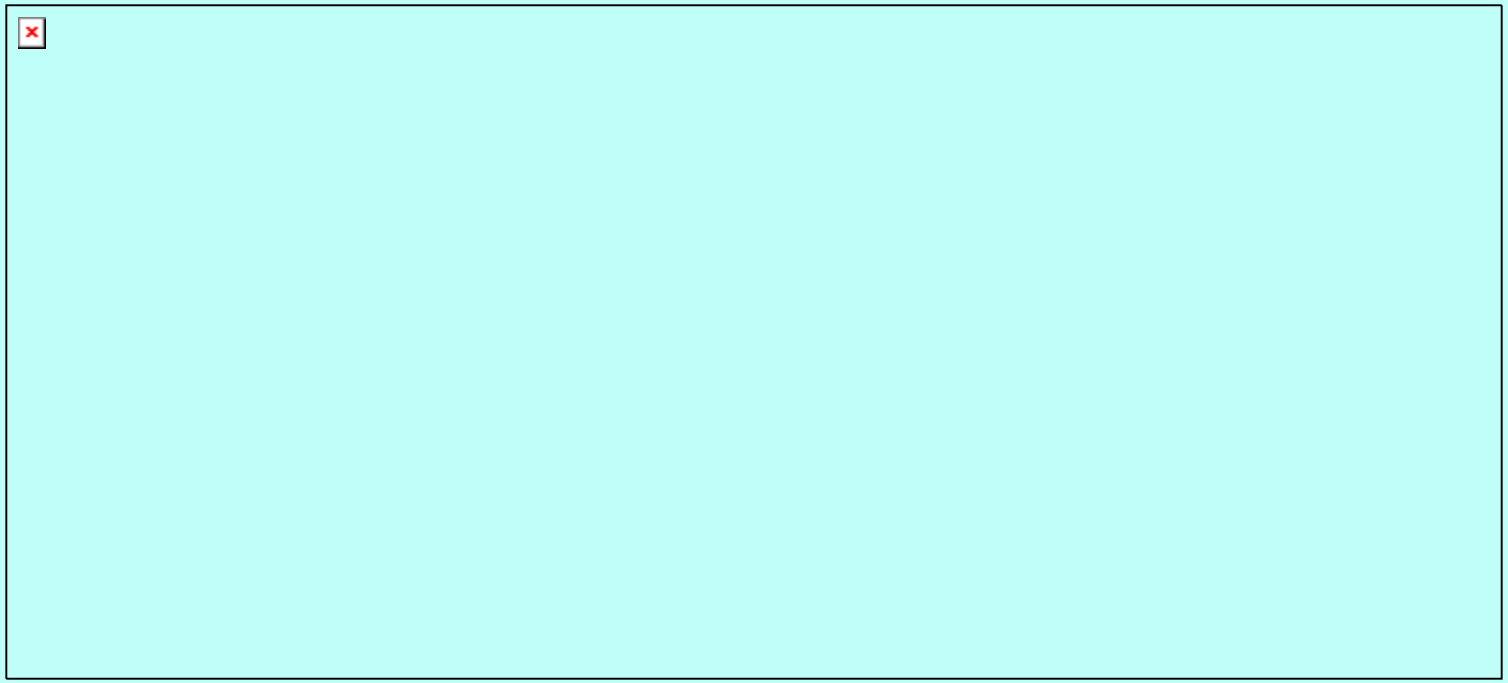


Descriptor.# 12/97

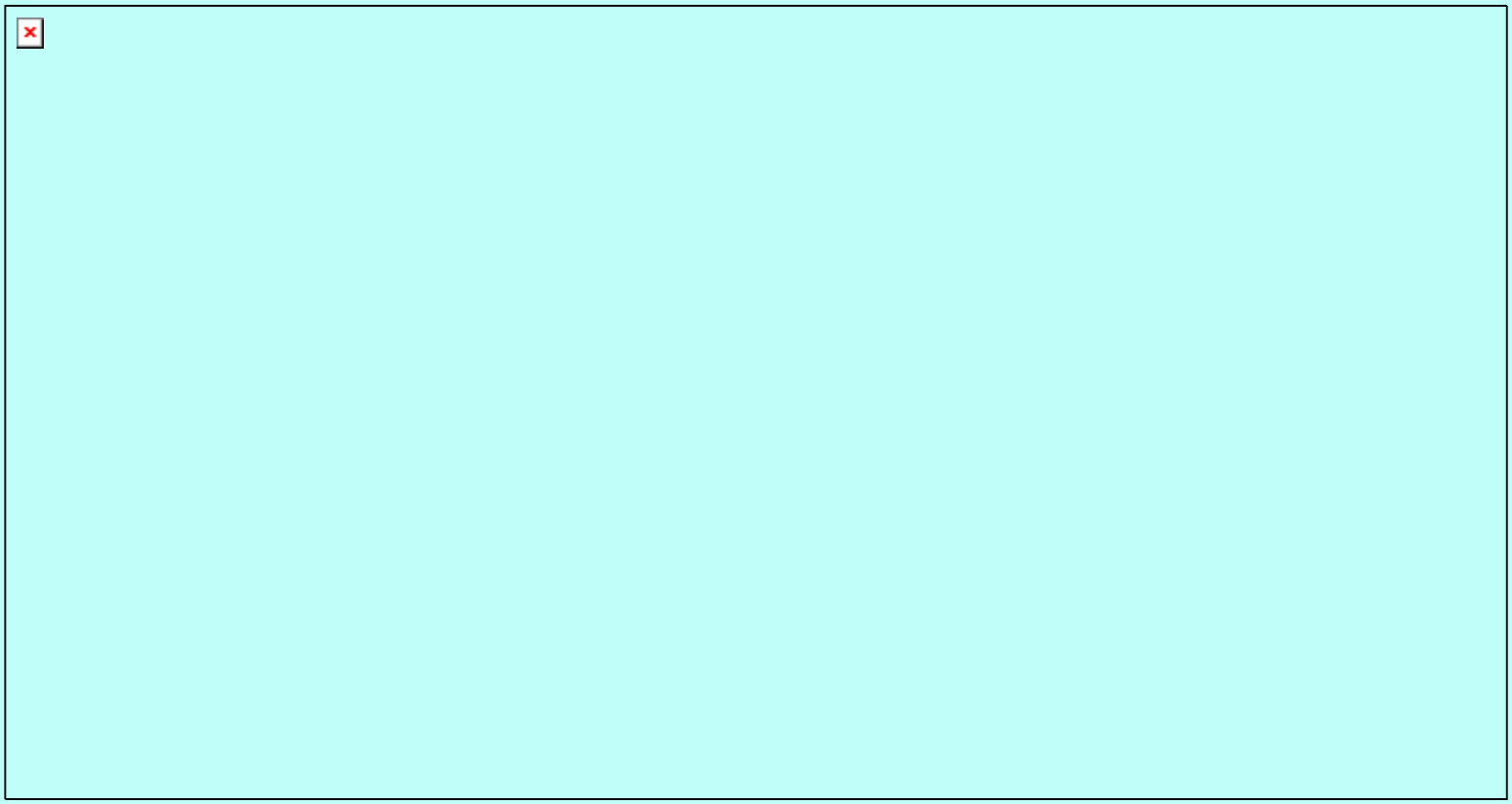
FY 2000 Planned Accomplishments and Issues - PFBC

- Test redesigned RQL MASB on LNG and propane/steam
- Modify circulating PFBC components to keep particles from entering turbine.
- Feed coal to circulating PFBC, integrated with MASB, CT, large S/W PCD
- Procure new PCD, gas cooler, and char transfer system for carbonizer

Rolls Royce/Allison Gas Turbine



RQL-MASB



FY 2002+ Budget Needs, Initiatives, Goals

- **Budget Needs: $20,000,000/year, adjusted for inflation long term, add support from other B& Rs and Vision 21**
- **Initiative: Negotiate 3ed phase, beyond 3/02**
- **Goals:**
  - **Add technologies/stakeholders**
  - **Support first user design needs**
  - **Incorporate Vision 21 technologies**
  - **Continuously improve process to get maximum efficiency, minimum capital cost, more reliable, cleaner operation**

FETC

PSDF Budget: 1999-2002

Program	1999	2000	2001	2002
PFBC	7,968	7,330	7,354	7,880
IGCC	10,322	12,105	10,000	12,000
Total	18,290	19,435	17,354	19,880

Summary

- The PSDF incorporates advanced power system technology modules into integrated process paths
- The PSDF size allows key component and system issues to be addressed
- The PSDF will support scaleup to demonstration plant size
- The result will be a reduction of emissions and the cost of electricity for future coal-fired power plants.