evaluation criteria listed in descending order of importance as codified at 10 CFR 605.10(d):

1. Scientific and/or Technical Merit of the Project,

2. Appropriateness of the Proposed Method or Approach,

3. Competency of Applicant's Personnel and Adequacy of Proposed Resources,

4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation will include program policy factors, such as the relevance of the proposed research to the terms of the announcement and an agency's programmatic needs. Note external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Non-federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

Information about development and submission of applications, eligibility, limitations, evaluation, selection process, and other policies and procedures may be found in 10 CFR part 605 and in the Application Guide for the Office of Science Financial Assistance Program. Electronic access to the Guide and required forms is made available via the World Wide Web at: *http://www.sc.doe.gov/production/grants/grants.html.* DOE is under no obligation to pay for any costs associated with the preparation or submission of applications if an award is not made. DOE policy requires that potential applicants adhere to 10 CFR 745 ''Protection of Human Subjects'', or such later revision of those guidelines as may be published in the **Federal Register**.

The Office of Science, as part of its grant regulations, requires at 10 CFR 605.11(b) that a recipient receiving a grant and performing research involving recombinant DNA molecules and/or organisms and viruses containing recombinant DNA molecules shall comply with the National Institutes of Health ''Guidelines for Research Involving Recombinant DNA Molecules,'' which is available via the World Wide Web at: *http://www.niehs.nih.gov/odhsb/biosafe/nih/rdna-apr98.pdf,* (59 FR 34496, July 5, 1994), or such later revision of those guidelines as may be published in the **Federal Register**.

The Catalog of Federal Domestic Assistance number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR part 605.

Issued in Washington DC on October 21, 2002.

John Rodney Clark,

Associate Director of Science for Resource Management.

[FR Doc. 02–27206 Filed 10–24–02; 8:45 am]

BILLING CODE 6450–03–P

DEPARTMENT OF ENERGY

National Energy Technology Laboratory

Notice of Availability of a Financial Assistance Solicitation

AGENCY: National Energy Technology Laboratory (NETL), U.S. Department of Energy (DOE).

ACTION: Notice of availability of a financial assistance solicitation.

SUMMARY: NETL announces that, pursuant to 10 CFR 600.8(a)(2), and in support of advanced coal research to U.S. colleges and universities, it intends to conduct a competitive Program Solicitation No. DE–PS26–03NT41634 and award financial assistance grants to qualified recipients. Applications will be subjected to a merit review by a technical panel of DOE subject-matter experts and external peer reviewers. Awards will be made to a limited number of applicants based on: the scientific merit of the applications, application of relevant program policy factors, and the availability of funds.

Once released, the solicitation will be available for downloading from the ''Industry Interactive Procurement System'' (IIPS) Internet page. At this internet site you will be able to register with IIPS, enabling you to download the solicitation and to submit an application. If you need technical assistance in registering or for any other IIPS function, call the IIPS Help Desk at 800–683–0751 or email the Help Desk personnel at *IIPS_HelpDesk@e-center.doe.gov.* Questions relating to the solicitation content must be submitted electronically through IPPS. All responses to questions will be released on the IIPS home page as will all amendments. The solicitation will only be available in IIPS.

DATES: The solicitation will be available for downloading on the DOE/ NETL's Homepage at *http://www.netl.doe.gov/business* and the IIPS ''Industry Interactive Procurement System'' Internet page located at *http://e-center.doe.gov* on or about October 21, 2002. Applications must be prepared and submitted in accordance with the instructions in the Program Solicitation and must be received at NETL by December 2, 2002. Prior to submitting your application to the solicitation, periodically check the NETL Website for any amendments.

FOR FURTHER INFORMATION CONTACT: Debra A. Duncan, U.S. Department of Energy, National Energy Technology Laboratory, PO Box 10940 (MS 921–107), Pittsburgh, Pennsylvania 15236–0940; Telephone: 412–386–5700; Facsimile: 412–386–6137; e-mail: *duncan@netl.doe.gov.*

SUPPLEMENTARY INFORMATION: Through Program Solicitation DE–PS26–03NT41634, the DOE is interested in applications from U.S. colleges and universities, and university-affiliated research centers submitting applications through their respective universities. Applications will be selected to complement and enhance research being conducted in related Fossil Energy programs. Applications may be submitted individually (*i.e.*, by only one college/university or one college partnering with one other college/university) or jointly (*i.e.*, by Ateams' made up of (1) three or more colleges/universities, or (2) two or more colleges/universities and at least one industrial partner. Collaboration, in the form of joint applications, is *encouraged* but not required.

Eligibility

Applications submitted in response to this solicitation must address coal research in one of the key focus areas of the Core Program or as outlined in the Innovative Concepts (IC) Phase I and Phase II Programs.

Background

The current landscape of the U.S. energy industry, not unlike that in other parts of the world, is undergoing a transformation driven by changes such as deregulation of power generation, more stringent environmental standards and regulations, climate change concerns, and other market forces. With these changes come new players and a refocusing of existing players in providing energy services and products. The traditional settings of how energy (both electricity and fuel) is generated, transported, and utilized are likely to be very different in the coming decades. As market, policy, and regulatory forces evolve and shape the energy industry both domestically and globally, the opportunity exists for universities, government, and industry partnerships to invest in advanced fossil energy technologies that can return public and economic benefits many times over. These benefits are achievable through the development of advanced coal technologies for the marketplace.

Energy from coal-fired powerplants will continue to play a dominant role as an energy source, and therefore, it is prudent to use this resource wisely and ensure that it remains part of the sustainable energy solution. In that regard, our focus is on a concept we call Vision 21. Vision 21 is a pathway to clean, affordable energy achieved through a combination of technology evolution and innovation aimed at creating the most advanced fleet of flexible, clean and efficient power and energy plants for the 21st century. Clean, efficient, competitively priced coal-derived products, and low-cost environmental compliance and energy systems remain key to our continuing prosperity and our commitment to tackle environmental challenges, including climate change. It is envisioned that these Vision 21 plants can competitively produce low-cost electricity at efficiencies higher than 60% with coal. This class of facilities will involve ''near-zero discharge'' energy plants—virtually no emissions will escape into the environment. Sulfur dioxide and nitrogen oxide pollutants would be removed and converted into environmentally benign substances, perhaps fertilizers or other commercial products. Carbon dioxide could be (1) Concentrated and either recycled or disposed of in a geologically permanent manner, or (2) converted into industrially useful products, or (3) by creating offsetting natural sinks for CO_2.

Clean coal-fired powerplants remain the major source of electricity for the world while distributed generation, including renewables, will assume a growing share of the energy market. Technological advances finding their way into future markets could result in advanced co-production and co-processing facilities around the world, based upon Vision 21 technologies developed through universities, government, and industry partnerships.

This Vision 21 concept, in many ways is the culmination of decades of power and fuels research and development. Within the Vision 21 plants, the full energy potential of fossil fuel feedstocks and ''opportunity'' feedstocks such as biomass, petroleum coke, and other materials that might otherwise be considered as wastes, can be tapped by integrating advanced technology ''modules.'' These technology modules include fuel-flexible coal gasifiers and combustors, gas for fuels and chemical synthesis. Each Vision 21 plant can be built in the configuration best suited for its market application by combining technology modules. Designers of Vision 21 plant would tailor the plant to use the desired feedstocks and produce the desired products by selecting and integrating the appropriate ''technology modules.''

The goal of Vision 21 is to effectively eliminate, at competitive costs, environmental concerns associated with the use of fossil fuel for producing electricity and transportation fuels. Vision 21 is based on three premises: that we will need to rely on fossil fuels for a major share of our electricity and transportation fuel needs well into the 21st century; that it makes sense to rely on a diverse mix of energy resources, including coal, gas, oil, biomass and other renewables, nuclear, and so-called ''opportunity'' resources, rather than on a reduced subset of these resources; and that R&D directed at resolving our energy and environmental issues can find affordable ways to make energy conversion systems meet even stricter environmental standards.

To accomplish the program objective, applications will be accepted in three program areas: (1) The Core Program, (2) the IC Phase I Program, and (3) the IC Phase II Program.

University Coal Research (UCR) Core Program

To develop and sustain a national program of university research in fundamental coal studies, the DOE is interested in innovative and fundamental research pertinent to coal conversion and utilization. The maximum DOE funding and period of performance for each Individual college/university award under the UCR Core Program is:

12 month project period: $ 80,000 (max. DOE funds)
13–24 month project period: $140,000 (max. DOE funds)
25–60 month project period: $200,000 (max. DOE funds)

Cost sharing is not required but is strongly encouraged.

The maximum DOE funding for each Joint university award (three or more universities partnering) under the UCR Core Program is $400,000 requiring a 36-month performance period. Cost sharing is not required but is strongly encouraged.

The maximum DOE funding for each Joint University/Industry award (two or more universities partnering with at least one industrial partner) under the UCR Core Program is $400,000 requiring a 36-month performance period. A minimum of twenty-five percent (25%) cost sharing of the total proposed project cost is required.

The DOE anticipates funding at least one application in each focus area under the UCR Core Program; however, high-quality applications in a higher priority focus area may be given more consideration during the selection process. Research in this area is *limited* to the following six (6) focus areas and is listed numerically in descending order of programmatic priority.

Core Program Focus Areas

Focus Area 1.0: Materials and Components for Vision 21 Systems

The advanced power systems concepts being pursued under Vision 21 are directed toward very high efficiency and low emissions, particularly of carbon dioxide. Many of these systems depend on the ability to separate hydrogen, oxygen, or carbon dioxide from mixtures containing these gases. Because of the very high overall efficiency and cost goals, R&D emphasizing gas separations and high temperature materials that are significant improvements over conventional methods/systems are of interest. Particular areas of interest are:

Focus Area 1.1: Membranes for Hydrogen Separation

Hydrogen separation in gasification-based systems can be a main source of low cost H_2 for use in refineries, as fuel for fuel cells, and for H_2 product gas. Various ceramic membranes, including both high- and low-temperature membranes and novel non-membrane methods are being developed and tested for hydrogen separation. Two types of ceramic membranes are being investigated for the recovery of hydrogen from coal gasification streams: porous membranes and dense membranes. These membrane types differ significantly in their microstructures, and, therefore, gas separation takes place by entirely different hydrogen diffusion mechanisms as described below. Grant applications are sought to further the development of either or both types of these ceramic membranes for commercial hydrogen production. Proposed approaches must demonstrate that the hydrogen can be produced in large quantities and at high purity; therefore, both the permeation properties and the selectivity of the membranes must be well characterized and understood.

Focus Area 1.2: Ultra-High Performance Materials

Intermetallic compounds offer the potential for the use of metallic structures at temperatures well above 1000 °1C, perhaps up to 1500 °1C. Ongoing progress in the development of these alloy systems suggests that properties can be achieved that will allow them to be used in engineering applications. The temperature range of interest overlaps that in which ceramic materials are thought to be needed, *i.e.*, these alloys are alternatives to ceramics. Examples of such alloys are Laves phase alloys such as Cr_2Ta and boron modified molybdenum silicide based on $Mo_5 Si_3$. The challenges with these alloys are to modify them to provide acceptable mechanical properties, including ductility and toughness, and corrosion resistance to allow them to be used in structural applications such as gas turbines. Innovative approaches to the processing of these materials are sought which will provide useful product forms while maintaining a structure that has adequate fracture toughness.

Focus Area 1.3: Coatings Development

Component reliability and long-term trouble-free performance of structural materials are essential in power-generating processes that utilize coal as a feedstock. The two major elements of this materials technology category address these concerns through the development of surface protection by coatings, claddings, *etc.,* and examination of the corrosion behavior of the structural components, (both alloys and ceramics) and protective (thermal and environmental) barriers applied to the component surfaces. There is a need to demonstrate/confirm the efficacy of conventional gas turbines in a coal-derived synthesis gas system. Different hot gas environments are obtained and there is a dearth of long-term performance data for these environments. Applications based on selection and verification testing of turbine hot path component materials and protective coatings are invited.

Additionally, hot corrosion and erosion-corrosion models to predict the lives of candidate gas turbine hot gas path materials in realistic environments for a gas turbine operating on coal-derived gases are needed. These models are necessary to assess potential lives of such components, and establish changes to these environments that would significantly extend these lives.

Focus Area 2.0: Sensors and Control

Sensors for high temperature (1000 °C), harsh environment applications represent a significant research and development challenge. New uses of high temperature materials or advancements in materials science are needed to develop the basis for novel in-situ or at line micro-sensing systems to monitor gases commonly present in coal and coal-derived syngas applications. Sensor materials and platforms capable of detecting one or more of the following are of interest: NO_X, SO_x, CO, H_2, O_2, CH_4, NH_3, mercury, and arsenic.

These sensors and detection systems, when placed in protective housings can serve as low cost devices that are critical to operating power systems at peak efficiency and minimal emissions. Subsequently, the sensing materials must be able to function appropriately at temperatures at or near 1000 °C, and the minimum test temperature for the sensors is 500 °C. Micro-sensors designed with or fabricated using high temperature substrates and materials including but not limited to silicon carbide, alumina, or sapphire are of interest. While revolutionary ideas that have the sound scientific basis to support significant advancements in this technology area are sought, extractive systems or incremental improvements over existing technology are discouraged.

In addition to gas sensor development, new approaches to embedded sensor designs or novel non-destructive evaluation (NDE) techniques that facilitate on-line monitoring of critical parts or components (*e.g.*, stress, corrosion, pressure, thermal barrier coating wear, refractory wear, *etc.*) are needed. Sensors need to be able to function in an ultra high temperature harsh environment. ''Smart'' sensing capabilities such as self-diagnostics and wireless data communication are desirable features.

Successful application of these sensors or NDE techniques will improve system control, protect capital equipment investment, and promote safety through prevention of catastrophic equipment failure. Equipment that could potentially benefit from component monitoring includes gasifiers, turbines, engines, pumps, advanced combustors, fuel cells; other equipment commonly employed in energy and power generation systems.

Focus Area 3.0: Advanced Coal Systems By-Product Utilization

Currently more than a million tons of byproducts are generated annually in the U.S. However, utilization rates of the material remain to be only approximately 30 percent. NETL has a goal to see utilization increased to 50% by 2010. Grant applications are needed to identify novel concepts for increased utilization of byproducts to assist in meeting NETL's utilization goal both in the gasification and coal combustion programmatic areas.

Focus Area 3.1: Gasification

The economics of gasification can be improved by fully utilizing all outlet streams of the process. Sale of value-added byproducts from waste streams and minimization of waste disposal can substantially improve the economics of gasification processes. By-products include ash/slag and sulfur. Applications are sought that will expand market options, such as improving the quality of slags and improving the use of sulfur. Applications are encouraged which do one of the following:

a. Seek to find, and provide proof of concept for, a viable commercial market for coal gasification slag in its natural high moisture, high carbon state.

b. Will develop the methods for reducing the carbon content, moisture content and particle size of the ash/slag so that it will be more marketable.

c. Would lead to the development of new markets and ways to utilize sulfur.

Focus Area 3.2: Coal Combustion

In December of 2001, Environmental Protection Agency (EPA) announced its intention to regulate mercury emissions from coal-fired power plants. Although the best mercury control technology has yet to be determined, DOE is funding tests where activated carbon is being used to control mercury emissions. Preliminary research suggests that the addition of activated carbon to the fly ash could make the fly ash unmarketable or increase the cost of disposal.

a. Research is necessary to identify technologies to mitigate the affects of high carbon concentrations on resale of the ash.

b. Novel utilization technologies for this fly ash that contains very high concentrations of either unburned or activated carbon.

Other environmental regulations are leading many utilities to install selective catalytic reduction systems (SCR). It has been estimated that 80–90 new installations of SCR will occur in the next several years. Questions exist as to the effect of SCR on ash samples from coal-fired units. Grant applications are sought to establish a better understanding of the effect of SCR systems on fly ash and consequently evaluating that fly ash for mercury removal potential including the specific characteristics of the fly ash that have higher mercury capture potential (*i.e.*, amount of carbon, form of carbon present, coal origin).

Finally, future regulations for emissions control of $PM_{2.5}$, regional haze or sulfur dioxide will require lower emissions of sulfur dioxide from power plants. Since many utilities will add flue gas desulfurization systems (FGD) that will generate additional quantities of by-products, grant applications are also sought to identify novel uses of this FGD material.

Focus Area 4.0: Computational Chemistry for Reforming Technology

The use of fuel cells is anticipated to undergo a large expansion in the future. The market for these power sources is expected to expand dramatically in the coming years because they offer high-energy efficiency and low emissions. Many fuel cells rely on high purity hydrogen as the fuel. When used in this way, hydrogen serves as an energy carrier. Hydrogen may be generated from conventional fossil fuels, coal being a foremost candidate. Although hydrogen has highly desirable properties for use in a fuel cell, its distribution from the central point of manufacture to the point of use remains a stubborn problem. At present, the infrastructure for the transport, storage, and dispensing of hydrogen is largely lacking and expensive to install.

Transporting and storing other fuels with higher volumetric energy density than hydrogen would alleviate some of the major roadblocks. Methanol is one potential energy transport molecule. Commercial production of methanol from coal is now well established. Reforming methanol to generate hydrogen at the point of use still needs to be improved. Catalytic reformers that can operate on a small scale intermittently, reliably, and efficiently over a long period of time are design challenges to chemical engineers. Computational chemistry is becoming an ever more powerful tool that speeds the development of improved catalysts. Application of computational chemistry to the development of leading principles for improved methanol reforming catalysts and catalytic systems can be an effective way to speed their entry into the marketplace.

To assist advancement in the field of methanol reforming technology, applications in computational chemistry that address fundamental chemical processes in producing fuel cell grade hydrogen from methanol are requested. Computational chemistry can provide guidance in the search for more effective, durable, and poison resistant catalytic materials. The overall intent is to speed the development of improved catalyst and reactor systems by providing insight on the major issues such as the function and use of promoters, coking resistance, stability during thermal cycling, and tolerance to operation over a range of flow and thermal conditions. The applications must deal with a specific methanol reforming issue in terms of the fundamental chemistry and physics of the molecular processes involved. Applications based on generic catalyst issues such as those called for in previous solicitations will not be considered unless they deal specifically with a methanol reforming.

Focus Area 5.0: Electrical Interconnects for Coal-Based Solid Oxide Fuel Cell Systems

The push toward oxygen-based coal gasification technologies creates an opportunity to supply pure oxygen to solid oxide fuel cell (SOFC) power generators supplied with coal synthesis gas. When operating on pure oxygen vice air, the power density of SOFCs is nearly double. The research challenge is to develop a suitable electrical interconnect that can survive in both the oxidizing environment of pure oxygen and the reducing environment of coal synthesis gas.

Much research has been performed in the past with regard to ceramic oxide interconnect materials, primarily on lanthanum chromate ($LaCrO_3$), for high temperature (>800 °C) operation. Recent developments in SOFC research have advanced the potential for lower temperature operation in the range of 500 to 800 °C.

Cold gas clean-up processes make the application of low temperature SOFCs more attractive by minimizing the energy requirements to heat both the oxidant and the fuel gas up to the SOFC operating temperature. Resolving oxidation problems with metallic interconnects to maintain high electrical conductivity in the relatively low partial pressure of oxygen in air is a major focus of current SOFC research. For coal-based SOFCs supplied with pure oxygen, even advanced metallic interconnects emerging from this research are expected to suffer serve oxidation. Thus a more robust ceramic-oxide interconnect capable of high electrical conductivity at temperatures ranges from 500 to 800 °C is required.

Grant applications are sought to investigate and characterize ceramic-oxide electrical interconnects, other than $LaCrO_3$ for SOFC applications in coal-based power plants. Of specific interest is fundamental research on ceramic interconnect material chemical, electrical conductivity and mechanical properties in oxidizing and reducing environments for coal-based power plants. It is particularly important to investigate the compatibility and adhesion of the interconnect, and the interfacial resistance with other SOFC components to make quality electrical connections with SOFC materials.

Focus Area 6.0: Partitioning and Mechanism Studies for Mercury and Associated Trace Metals Within Coal-Fired Processes

Understanding mercury chemistry and process-related speciation mechanisms and transformations in laboratory experiments provide necessary steps to first understanding partitioning and subsequently developing mercury removal processes for industrial and coal-fired applications for PC-boilers, cyclone boilers, tangentially-fired boilers, fluidized-bed boilers and gasification processes. Past research has shown a reasonable link between mercury speciation and several parameters including the various constituents of fly ash (*i.e.*, unburned carbon/ LOI); fly ash properties (such as fly ash alkalinity); and process specific information (coal rank, boiler type, flue-gas temperature, Cl concentration, NO_X concentration, sulfur compounds, and CO/CO_2 concentrations).

Grant applications are sought to further understand partitioning and chemistry of mercury and other trace metal and organic substances in coal-fired (bituminous, subbituminous, and lignite) systems. Specifically, modeling or experiments using statistical analysis of these identified parameters on chemical intermediaries and mechanisms is sought.

UCR IC Phase I Program

The goal of solicited research under the IC Phase I Program is to develop unique approaches for addressing fossil energy-related issues. These approaches should represent significant departures from existing approaches, not simply incremental improvements. The IC Phase-I Program seeks ''out-of-the-box'' thinking; therefore, well-developed ideas, past the conceptual stage, are not eligible for the Phase I Program. Applications are invited from individual college/university researchers. The maximum DOE funding for each Phase I award under the IC Program is $50,000 and will require a 12-month performance period. Joint applications (as described under the Core Program) will also be accepted, although no additional funds are made available for joint versus individual applications. Unlike the Core Program, student participation in the IC Phase I proposed research is strongly encouraged, however, not required.

In the twenty-first century, the challenges facing coal and the electric utility industry continue to grow.

Environmental issues such as pollutant control, both criteria and trace pollutants, waste minimization, and the co-firing of coal with biomass, waste, or alternative fuels will remain important. The need for increased efficiency, improved reliability, and lower costs will be felt as an aging utility industry faces deregulation. Advanced power systems, such as a Vision 21 plant, and environmental systems will come into play as older plants are retired and utilities explore new ways to meet the growing demand for electricity.

Innovative research in the coal conversion and utilization areas will be required if coal is to continue to play a dominant role in the generation of electric power. IC applications will be accepted in any of the focus areas listed in the Core Program or the following seven (7) IC Phase II focus areas that are shown in random order and not in order of programmatic priority.

IC Phase I Focus Areas

Focus Area 1.0: Smart Sensors

The development of innovative concepts and techniques for smart sensing are needed to foster the development and implementation of advanced power generation technologies using coal or coal derived syngas. Approaches to sensing combustion related parameters at ultra-high temperatures using laser-based techniques and other non-destructive rapid assessment techniques are encouraged.

Many innovative approaches to sensing are being developed using laser-based techniques or micro-sensors fabricated with silicon as the substrate material. While these developments are viewed favorably, the are not applicable to many industrial systems due to the high temperature harsh conditions. This solicitation seeks to overcome the temperature barriers associated with novel sensing techniques.

The ultimate goal is the utilization of sensor networks, which are low cost, reliable, and accurate for the real-time monitoring. Integrating these sensor networks with advanced control algorithms are envisioned for the on-line optimization of complex power and chemical production facilities conceived under the Vision 21 Program.

Focus Area 2.0: N_2/CO_2 Separation

Since the primary source of greenhouse gas emissions, primarily carbon dioxide, is combustion of fossil fuels such as coal or natural gas, options to reduce carbon dioxide emissions are being examined. In particular, inorganic membranes based on metals, ceramics or zeolites are suitable for the separation of such gases because they can sustain severe conditions such as high pressure, chemical corrosion, and high temperature. Approaches are needed whereby the membrane can be tailored to separate carbon dioxide from the nitrogen, the latter being the predominant component in the flue gas of a fossil fuel fired power plant. For example, the separation could be caused by dopants in the inorganic membrane that prefer to bond with carbon dioxide and facilitate its surface diffusion along the pore wall. Applications are invited wherein factors such as concentration of dopant and pore diameter will be investigated, along with molecular simulations, in order to maximize the separation factor.

Focus Area 3.0: Direct Utilization of Carbon in Fuel Cells

High and intermediate temperature fuel cells offer significant advantages in the direct conversion of carbon to electrical power without an intermediate coal gasification process. Both slurry based and solid-state (*e.g.*, consumable electrodes) based fuel cells have the potential to more directly utilize coal than conventional fuel cell technologies that operate on clean coal synthesis gas.

Grant applications are sought for identification and characterization of one or more (considering the time and financial constraints) fuel cell concepts that utilize carbon from coal. The characterization should demonstrate as much as possible both the power density achievable and the degree of power degradation versus operating time. The characterization should include chemical stability between the components and the impact of coal contaminants on fuel cell performance and operating life. Lifetime effects (phase stability, thermal expansion compatibility, conductivity aging, and electrode sintering) should be considered and characterized as much as possible. The characterization of the material set should in general be as complete as possible and not duplicate publicly known information.

Focus Area 4.0: Mercury and Associated Trace Metal Chemistry Studies Within NO_X Control Systems

By the year 2010, it is estimated that over 50% of coal-fired utilities will install either selective catalytic reduction or selective non-catalytic reduction units to meet NO_X emission limits. Understanding mercury chemistry and process-related speciation mechanisms and transformations related to NO_X control systems would provide necessary information to develop more effective, less costly mercury removal processes for industrial and coal-fired boilers. Past research has shown a probable relationship between degree of mercury oxidation and age of NO_X catalyst, coal rank, size (or residence time) of NO_X control vessel, degree of NO_X conversion, amount of SO_2 converted to SO3, and ammonia slip. Grant applications are sought to further understand partitioning and chemistry of mercury and other trace metal and organic substances in coal-fired (bituminous, subbituminous, and lignite) systems utilizing SCR/SNCR or ammonia injection. Specifically, statistical analysis clarifying the importance of each of these identified parameters and/or their interactions on chemical intermediaries and mechanisms is sought.

Focus Area 5.0: Water Impacts From Coal-Burning Power Plants

Producing electric power from coal has impacts to water quality from the beginning of the process, mining the coal, to the disposal of ash remaining after the coal has been combusted. Coal mining has left large amounts of overburden wastes that contain sulfide minerals that weather to form sulfuric acid. Many of these areas are causing problems with water quality and re-vegetation. It is estimated that 10,000 miles of streams in the United States are affected by acid mine drainage. The Environmental Protection Agency (EPA) has initiated a Total Maximum Daily Load (TMDL) program to restore impaired water bodies, some of which are degraded from past mining. Coal washing is used to remove pyritic sulfur and other impurities that could be emitted into the air; however, wastewater from this process may release these substances to water bodies. A large quantity of water is used in power plants to condense the steam leaving the turbine. Once-through cooling systems can damage aquatic life and add heat to streams. The EPA has developed new regulations under the Clean Water Act, section 316(b), to reduce once through cooling usage of water and improve cooling water intake structures. Re-circulating cooling towers require the addition of biocides and corrosion inhibitors, which may be released to water bodies during blowdowns. Wet scrubbing of air pollutants from flue gas generates a large quantity of wastewater. Ash ponds have the potential for creating run-off problems and groundwater infiltration. Research opportunities for improving water quality associated with coal combustion for power generation include: (1) Novel active and passive treatment technologies to address acid mine drainage; (2) innovative solutions to restoring abandoned mine lands to enhance watersheds; (3) improved intake and outflow structures for cooling water; (4) novel uses for waste heat from power plant cooling; (5) advanced water-related sensors and controls at power plants to minimize adverse impacts to water quality; (6) novel treatment techniques for scrubber wastewater; and (7) novel techniques for reducing coal-washing waste and ash pond runoff.

Focus Area 6.0: Simulation of CO_2–Brine-Mineral Interactions

One strategy under evaluation to mitigate increasing atmospheric concentrations of CO_2 is to inject it into geological formations such as deep saline aquifers. When CO_2 is injected into brine formations it can be trapped by several mechanisms. The CO_2 can react with the host rock and/or brine to form mineral carbonates (mineral trapping) or it can become dissolved in and react with the slow moving basinal brine (hydrodynamic trapping) to form carbonic acid and its dissociation products. Mineral trapping is the preferred storage mechanism. In order the begin to evaluate the feasibility of geological sequestration in deep saline aquifers the thermodynamic and kinetic properties of the H_2O-CO_2–NaCl system must be known in order to simulate chemical reactions in these complex systems. These properties are not only critical for the interpretation of laboratory experiments, but also to field scale tests, and reservoir scale simulation. Most simulations of these systems use an equation of state (EOS) to describe the properties of the H_2O–CO_2–NaCl system. The thermodynamic properties for gas-liquid-salt systems can be described by EOS, which describes the quantitative relationships between intensive parameters of a system (*e.g.*, T, P) and extensive parameters (*e.g.*, volume, mass). Consequently, research directed toward evaluation of the ability of existing EOS to accurately estimate the properties of this system is of interest to the U.S. DOE.

Grant applications directed toward critical evaluation of the ability of existing equations of state (EOS) to predict the properties of the H_2O–CO_2–NaCl system at temperatures up to 200 C and pressures up to 500 atmospheres are sought. A comparison of the ability of existing EOS to describe the properties of the system under these conditions is needed. An estimation of the deviation between properties predicted using various EOS found in the literature with measured values under a wide range of temperature and pressure must be included. Based upon the results of this evaluation of existing EOS, the researchers may decide to develop a new EOS as part of the application.

Focus Area 7.0: CO_2 Separation From Coal Gasification Process

Separation of CO_2 from coal derived synthesis gas for capture and sequestration is a key technology in the reduction of greenhouse gases emissions to the environment. If required today, existing technologies, such as Rectisol and Selexol, can be applied to capture CO_2; however, such applications require expensive solvent and operate at less than 40°C, imparting a severe energy penalty on the system. The following CO_2 separation technologies are being investigated in existing projects: production of carbon dioxide hydrates, dry scrubbing processes with regenerable sorbents, and membrane separation (dense ceramic and polymer). Applications are invited that incorporate ''outside-the-box'' approaches to the separation of CO_2 from the coal gasification process. As this would be the first step toward a completely novel approach, applications comprising literature studies, theoretical approaches and/or modeling analysis, etc. would be expected. The goal of this work would be to find an approach that:

1. Does not require expensive/proprietary solvents or cool temperatures.
2. Is not already being considered by existing projects.
3. Minimizes the cost of CO_2 separation.

Technologies that produce both high-pressure hydrogen and CO_2 (in separate streams) are preferred.

UCR IC Phase II Program

The goal of the Phase II Program, the principal R&D effort of the IC Program, is to solicit research that augments research previously funded through the Phase I Program. Only recipients receiving a Phase I grant awarded in fiscal year 2001 will be eligible to submit an application for continuation of their Phase I projects. The maximum DOE funding for each Phase II award under the IC Program is $200,000 and will require a 36-month performance period. Its anticipated that institutions submitting an application with approaches that appear sufficiently promising from the Phase I efforts could receive a Phase II award in 2003.

Applications will be accepted in the following focus areas:

Focus Area 1.0 Advanced Sensors for Vision 21 Systems

Focus Area 2.0 Carbon Sequestration

Focus Area 3.0 Mercury and Other Emissions in Advanced Power Systems

Focus Area 4.0 Thermodynamics Measurement for Mixture of Asymmetric Hydrocarbons

Issued in Pittsburgh, PA on October 16, 2002.

Dale A. Siciliano,

Acting Director, Acquisition and Assistance Division.

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DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. RP02–495–001]

Algonquin LNG, Inc.; Notice of Compliance Filing

October 18, 2002.

Take notice that on October 11, 2002, Algonquin LNG, Inc. (ALNG) tendered for filing as part of its FERC Gas Tariff, First Revised Volume No. 1, Sub Seventh Revised Sheet No. 83, to be effective October 1, 2002.

ALNG states that it is making this filing pursuant to a letter order issued by the Commission in the captioned docket on September 26, 2002. The September 26 order conditionally accepted tariff sheets filed with ALNG's initial compliance filing for implementation of Order No. 587-O, subject to ALNG filing certain explanations. This filing includes the requested explanations and a revised tariff sheet that reflects modifications in accordance with the September 26 order.

ALNG states that copies of its filing have been mailed to all affected customers, state commissions and parties on the Commission's official service list in this proceeding.

Any person desiring to protest said filing should file a protest with the Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426, in accordance with section 385.211 of the Commission's Rules and Regulations. All such protests must be filed in accordance with Section 154.210 of the Commission's Regulations. Protests will be considered by the Commission in determining the appropriate action to be taken, but will